

JOURNAL of the American Veterinary Medical Association

FORMERLY
AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

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JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 716 Book Building, Detroit, Mich.

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Vol. LXIX, N. S. Vol. 22

August, 1926

No. 5

REDUCED FARES TO LEXINGTON

Reduced fares on the certificate plan have been granted by the various passenger associations in connection with the Lexington meeting, contingent upon at least 250 of those in attendance at the meeting traveling by rail and securing the proper certificates. These should be requested when tickets are purchased going to Lexington.

A very important thing to keep in mind is the fact that *every certificate counts*, whether the owner uses it to secure the reduced fare returning or not. In other words, no matter what your plans are for the return trip, if you travel to Lexington by rail, be sure to secure a certificate when you purchase your ticket. Immediately upon arrival in Lexington turn in your certificate to the Secretary. The certificates will be validated only after the requisite number of 250 have been turned in.

Members of the Association and visiting veterinarians who attend the convention, as well as dependent members of their families, who have paid the regular one-way fares (tariff fares over 67c or more) on the going trip, via routes over which one-way tickets are regularly sold, will be ticketed back to their starting-points by the route traveled in going to the convention, at one-half of the regular one-way fare from Lexington to the original starting-point.

Certificates will show the purchase of tickets not earlier than dates specified by the various passenger associations and when validated by the special agent at Lexington will be honored for return-trip tickets at one-half of the normal one-way fare, if presented not later than August 24.

Arrangements have been made to validate the certificates during the four days of the convention, August 17, 18, 19 and 20. The reduced fare for the return journey will not apply unless the owner of the certificate is properly identified, as provided for by the certificate. Such identification will be made by the Secretary at the convention. To avail yourselves of the reduced fare, returning, it will be necessary to make the return trip over the same route used in going to Lexington.

Do not forget. Every certificate will count. Help us to secure the necessary number of 250, irrespective of whether it is your intention to use the certificate or not. Secure your certificate when you purchase your ticket and turn it over to the Secretary when you register at the meeting.

Lexington! Let's Go!

ITINERANT EXPERTS

It was with feelings mingled with both genuine amusement and no small amount of discomfort that we recently spent a good half-hour in examining a collection of newspaper clippings, all on the subject of free poultry and swine clinics, held throughout the states comprising the Corn Belt.

Many of the clippings were of the "boiler-plate" variety, but modified just enough to fit local conditions. All either announced the coming of an "expert" or reported his presence in town, usually under the auspices of the local druggist, feed store, corner grocery, garage, hardware dealer or poultry club. One clipping announced a clinic to be held in connection with the annual McLean County (Ill.) Poultry Show, in the Farm Bureau Hall, at Bloomington, in December last. Another indicated that the itinerant expert had been favorably received by the classes in vocational agriculture of the Mt. Vernon (Ind.) High School, and that the members accompanied the expert to one of the local poultry farms for a clinic.

The preliminary announcements are in the form of invitations to be present and get something free. For example: "Dr. A. (followed by his pedigree) will speak on 'The Inside of the

Chicken and Pig.' You are invited to attend and bring your troubles with you as to the raising of poultry and hogs. No admission will be charged." Another announcement says: "This is not a sales campaign of hog and poultry remedies but a short course school, teaching farmers how to diagnose, treat and prevent diseases common to poultry and hogs. . . . You may not be having losses now but the day will come when you will. Hear this expert and be prepared."

The newspaper reports of the doings of the experts are equally interesting. Here is one: "Wednesday afternoon the Melba Theatre was the scene of a show that was just a little out of the ordinary. Dr. B. (his pedigree here) was in charge of a demonstration of the ailments of hogs and chickens and those who attended got a number of ideas that should be of use in caring for their live stock. Dr. B. cut up two pigs and a number of chickens and certainly was an adept in every thing he did." This was followed by the usual statement as to the purely philanthropic motives of the sponsors.

By the time we get over into Ohio we really get the first reliable information as to the precarious condition of the poultry industry there. In the announcement made at Oak Harbor, comment was made on the terrible state of affairs in and around Archbold, where the experts found "twelve different specimens of trouble with poultry, all the way from T. B. to tape worms." The prospective seeker after truth is told: "You will not be solicited to buy any merchandise at this clinic inasmuch as it is being held for purely educational purposes with regard to the prevention of diseases among poultry and swine. Ladies cordially invited."

Over at Clinton, Ill., Dr. C., "the great specialist who has devoted his life to the study of diseases of chickens and swine," cast such a spell over his audience that the farmers "forgot all about their chores until it was well past chore time," surely a wonderful testimonial of his spell-binding ability, not to mention personal charm.

Now what does all this mean? Is this the way the modern farmer or poultryman wants to get his information about animal diseases? How many are fooled among those who are lured into thinking they are getting something for nothing? Is the veterinary profession responsible, either in whole or in part, for this state of affairs? If so, what can we do to correct it? Are the agricultural colleges, through their extension departments, doing

anything to offset these pernicious practices? How many of the tens of thousands who are reported to have attended these clinics are the former agricultural college students who were destined to be the best clients of veterinarians? Can these questions be answered with the statement that we are living in an age of self-medication, when it is the style for everybody to be his own physician and veterinarian?

Is it no longer going to be necessary to have veterinarians? If there is no demand for veterinarians in private practice, it is only a question of time when there will be no supply. However, one of the clippings tells us that Dr. D. is one of sixty veterinarians on the road for his concern, all holding free clinics in different parts of the country. Is this to be the public's conception of a veterinarian—a man going from town to town, cutting up chickens and pigs, to see what ails them? No young man is going to a veterinary college, to spend his time and money, to fit himself for the rôle of an itinerant expert.

How long will the public bite at the *free* bait? How can these experts exist when they make no charge for their entertainments? The answer, of course, is easy. One clipping reports that one of these hog remedy companies had just declared a semi-annual dividend of 8 per cent and that the capacity of its factory was about to be doubled. Another company was spending \$100,000 enlarging its plant and expanding its territory. One clipping stated that one of these concerns was doing a million-dollar business annually.

The whole situation is merely another sample of the many "cheap substitutes" being offered for veterinary services. We freely admit our inability to offer any easy, immediate and satisfactory solution of the problem. On numerous occasions we have offered what we thought to be helpful advice. Fundamentally, the same advice holds in this case. As far as chicken diseases are concerned—study them. Become just as familiar with them as you are with bovine or equine disorders. Get your clients into such a frame of mind that they will think of you just as quickly when they have sick chickens, as they do when they have sick horses. Be prepared to demonstrate conclusively to your clients that it is to their advantage—financial as well as otherwise—to employ competent veterinary services for solving any problems connected with animals. That's your job. Nobody can do it for you as well as you can do it for yourself.

And now just one more word in closing. If you are a prac-

tioner, and have read our previous editorials urging veterinarians to pay more attention to poultry diseases, do not get the idea that this editorial is another "spanking." Think of it in the terms of a stimulus to perform a greater and more useful service. Even if you, right down in your heart, do not like poultry practice, or even if you conscientiously feel that you do not know all you should about poultry diseases, remember this: Every time you turn a client away with a statement that you do not know much about poultry diseases, or words to that effect, you are making an opening for some brand of the cheap substitutes for veterinary service to step in.

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

LEXINGTON HOTELS

The following rates will prevail at the Phoenix Hotel:

Single room without bath, \$2.00 per day.

Double room without bath, \$3.50 per day.

Single room with bath, \$2.75, \$3.00 and \$4.00.

Double room with bath, \$5.00, \$6.00 and \$6.50.

Double room with bath (twin beds), \$6.00, \$7.00 and \$10.00.

Where three or more persons occupy the same room without bath, a charge of \$1.50 each will be added to the regular rate. In rooms with bath the charge will be \$2.00 for each additional person over the regular rate.

The rates for the Lafayette Hotel are as follows:

Single room with bath \$3.00, \$3.50 and \$4.00 per day.

Double room with bath (one double bed) \$4.50, \$5.00 and \$6.00 per day.

Double room with bath (twin beds) \$5.00, \$6.00, \$6.50 and \$7.00 per day.

Rooms rented en suite, two connecting rooms with bath between (two persons) \$3.50 per person.

Two connecting rooms with bath between (three persons) \$3.25 per person.

Two connecting rooms with bath between (four persons) \$3.00 per person.

***In the Heart of the Blue Grass
August 17-18-19-20, 1926***

A. V. M. A. NOTES

The first A. V. M. A. (U. S. V. M. A.) convention attended by the ladies was in Buffalo meeting in 1896.

The 1926 report of the Secretary will show the territory of Hawaii with eighteen veterinarians, all members of the A. V. M. A. and all with dues for 1926 paid up in full, thanks to the careful watchfulness of our Resident Secretary, Dr. P. H. Browning.

ON TO LEXINGTON

BIRD'S-EYE VIEW OF PROGRAM

	Monday Aug. 16	Tuesday Aug. 17	Wednesday Aug. 18	Thursday Aug. 19	Friday Aug. 20
MORNING		Opening Session	Sectional Meetings	Sectional Meetings	Business Session
AFTERNOON	Meeting of Executive Board	Business Session	Business Session	Trip to Breeding Farms	Clinic
EVENING	State Association Conference	Alumni 6:00 President's Reception 8:00 Dance	General Session — Papers	Banquet	Open

Lexington—the Home of Culture and Agriculture

DELEGATES TO LEXINGTON CONFERENCE

Following are the names of the delegates selected by some of the state veterinary medical associations to attend the conference in Lexington the evening before the meeting. It is more than likely that other delegates have been selected, although the list contains the names of all those who have been reported to the Secretary, up to the time of going to press.

Delaware.....	Dr. C. C. Palmer, Newark.
Florida.....	Dr. J. V. Knapp, Tallahassee.
Iowa.....	Dr. E. R. Steel, Grundy Center.
Kentucky.....	Dr. E. Calldemeier, Louisville.
Maryland.....	Dr. R. V. Smith, Frederick.
Massachusetts.....	Dr. E. A. Crossman, Boston.
Michigan.....	Dr. Andrew McKercher, Lansing.
Mississippi.....	Dr. O. M. Norton, Greenville.
Missouri.....	Dr. A. T. Kinsley, Kansas City.
Nevada.....	Dr. Geo. E. Bamberger, Reno.
New York.....	Dr. J. N. Frost, Ithaca.
North Carolina.....	Dr. J. P. Spoon, Burlington.
Ohio.....	Dr. F. A. Zimmer, Columbus.
Oklahoma.....	Dr. C. R. Walter, Tulsa.
Pennsylvania.....	Dr. H. R. Church, Harrisburg.
Texas.....	Dr. W. R. Sanderson, Brownwood.
Virginia.....	Dr. W. H. Ellett, Midlothian.
Wisconsin.....	Dr. R. S. Heer, Platteville.
	Alt. Herbert Lothe, Waukesha.

A Big Meeting, A Big Time and A Big Welcome.

OUTLINE OF PROGRAM**MONDAY, AUGUST 16, 1926**

- MORNING —Committee meetings.
AFTERNOON—Meeting of Executive Board.
EVENING —Conference of accredited delegates from state, provincial and territorial veterinary associations.

TUESDAY, AUGUST 17, 1926

- MORNING —Opening session. Address of welcome. Response. President's address. Ladies attend.
AFTERNOON—General session. Reports of Executive Board and officers.
Meeting of Women's Auxiliary.
EVENING —Meetings of college alumni groups.
President's reception. Dance.

WEDNESDAY, AUGUST 18, 1926

- MORNING —Sectional meetings. Papers.
Automobile trip for ladies.
AFTERNOON—General session. Reports of Executive Board and committees. Election of officers.
EVENING —General session. Papers only.
Special entertainment for ladies.

THURSDAY, AUGUST 19, 1926

- MORNING —Sectional meetings. Papers.
Shopping trip for ladies.
AFTERNOON—Trip to breeding farms.
EVENING —Banquet.

FRIDAY, AUGUST 20, 1926

- MORNING —General session. Reports of Executive Board and committees. Unfinished business. New business. Installation of officers.
Sight-seeing tour of Lexington for ladies.
AFTERNOON—Clinic.
Shopping trip for ladies.
EVENING —Open.

Almost a year after the Portland meeting, newspapers were still commenting on the "barkless dog" operation performed at the clinic. The most recent newspaper item noted bore a date line of June 24, 1926.

PAPERS**SECTION ON GENERAL PRACTICE****FIRST SESSION**

Wednesday, August 18, 1926. 9:00 A. M.

Chairman's Address—Dr. E. R. Steel, Grundy Center, Iowa.

Secretary's Report—Dr. J. N. Frost, Ithaca, N. Y.

PAPERS

1. Anatomical Changes in Lamenesses of the Horse—Dr. R. R. Dykstra, Kansas State Agricultural College, Manhattan, Kans. (Illustrated.)

Section on General Practice

DR. E. R. STEEL
Practitioner
Grundy Center, Iowa
Chairman



DR. J. N. FROST
N. Y. State Veterinary College
Ithaca, N. Y.
Secretary

2. Diseases of the Head of Horses—Dr. H. E. Bemis, Iowa State College, Ames, Iowa.
3. Physiology of the Ruminant Stomach—Drs. A. F. Schalk and R. S. Amadon, North Dakota Agricultural College, Fargo, N. D.
4. Digestive Disturbances of Cattle—Dr. M. G. Fincher, New York State Veterinary College, Ithaca, N. Y.
5. Biological and Medicinal Agents for Poultry—Dr. Alvin Broerman, Ohio Department of Agriculture, Reynoldsburg, Ohio. Discussion by Dr. Cliff D. Carpenter, Petaluma, Calif.

SECOND SESSION

Thursday, August 19, 1926. 9:00 A. M.

1. Operations of the Udder and Teats—Dr. C. H. Case, Akron, Ohio.
2. The Use and Limitations of the Serological Tests for the Bang Abortion Disease of Cattle—Dr. J. W. Connaway, University of Missouri, Columbia, Mo.
3. (a) Local Anesthesia in Obstetrical Work and in Diseases of the Genital Organs. (b) A New Wire-saw Instrument in Veterinary Obstetrics—Dr. Franz Benesch, Vienna, Austria.
4. Diagnosis and Differential Diagnosis of Contagious Abortion in Mares and the Results of Vaccination—Dr. W. W. Dimock and Prof. E. S. Good, University of Kentucky, Lexington, Ky.

Election of Section Officers.

SECTION ON SANITARY SCIENCE AND POLICE
(FOOD HYGIENE)

FIRST SESSION

Wednesday, August 18, 1926. 9:00 A. M.

Chairman's Address—Dr. Edw. A. Cahill, Indianapolis, Ind.

Secretary's Report—Dr. N. F. Williams, Fort Worth, Texas.

1. Meat Hygiene—Dr. F. H. S. Lowrey, Department of Agriculture, Toronto, Ont.
2. Municipal Milk and Dairy Inspection—Dr. E. D. King, Jr., City Meat and Dairy Inspector, Valdosta, Ga. (Illustrated.)
3. How and by Whom is the Food Hygiene in Your City Cared For?—Dr. W. G. Hollingworth, Bureau of Health, Utica, N. Y.

Discussion of these papers will be opened by Dr. H. C. Givens, State Veterinarian, Richmond, Va.

SECOND SESSION

Thursday, August 19, 1926. 9:00 A. M.

1. Abortion Vaccine an Important Factor in the Economic Control of Abortion—Dr. G. E. Corwin, Deputy Commissioner of Domestic Animals, Hartford, Conn.
2. Efforts to Control Contagious Abortion by Sanitary Measures and Serological Tests—Dr. Joe H. Bux, State Veterinarian, Little Rock, Ark. Discussion by Dr. R. C. Dunn, Texas A. & M. College, College Station, Texas.

3. Methods of Anthrax Immunization—Dr. C. E. Salsbery, Jensen-Salsbery Laboratories, Kansas City, Mo. Discussion by T. O. Scott, Practitioner, Waco, Texas.
4. Some Observations on the Duration of Immunity in Baby Pigs Following Serum and Virus Treatment—Dr. E. A. Tunnicliff, University of Illinois, Urbana, Ill. Discussion by Dr. A. T. Kinsley, Kinsley Laboratories, Kansas City, Mo.

Election of Section Officers.

Section on Sanitary Science and Police (Food Hygiene)



DR. E. A. CAHILL
Pitman-Moore Co.
Indianapolis, Ind.
Chairman



DR. N. F. WILLIAMS
State Veterinarian
Fort Worth, Texas
Secretary

SECTION ON EDUCATION AND RESEARCH

FIRST SESSION

Wednesday, August 18, 1926. 9:00 A. M.

Chairman's Address—Dr. E. T. Hallman, East Lansing, Mich.
Secretary's Report—Dr. E. M. Pickens, College Park, Md.

1. Some Suggestions on Veterinary Education and the Profession—Dr. C. H. Stange, Iowa State College, Ames, Iowa.
2. Education and Veterinary Medicine—Dr. V. A. Moore, New York State Veterinary College, Ithaca, N. Y.
3. The Teaching of Veterinary Medicine to Agricultural Students—Dr. D. S. White, Ohio State University, Columbus, Ohio.

4. Idiopathic Streptococcic Peritonitis in Poultry—Dr. H. C. H. Kernkamp, University of Minnesota, St. Paul, Minn.
5. Two Basic Factors in Coccidial Infection of the Chicken—Dr. W. T. Johnson, Oregon Agricultural College, Corvallis, Ore.

SECOND SESSION

Thursday, August 19, 1926. 9:00 A. M.

1. Genital Infection in Mares by an Organism of the Encapsulatus Group—Drs. W. W. Dimock and P. R. Edwards, University of Kentucky, Lexington, Ky.

Section on Education and Research



DR. E. T. HALLMAN
Michigan State College
East Lansing, Mich.
Chairman



DR. E. M. PICKENS
University of Maryland
College Park, Md.
Secretary

2. A Rapid Method of Performing the Agglutination Test for Bovine Infectious Abortion—Dr. I. F. Huddleson, Michigan State College, East Lansing, Mich.
3. Results of Injecting Pregnant Heifers with Brucella Abortus Isolated from Man—Dr. C. M. Carpenter, New York State Veterinary College, Ithaca, N. Y.
4. Studies in the Diagnosis of Bacillary White Diarrhea in Mature Fowls—Drs. Robert Graham and E. A. Tunnicliff, University of Illinois, Urbana, Ill.

5. Observations on Hens Reacting to the White Diarrhea Test
—Dr. B. A. Beach and Prof. J. G. Halpin, University of
Wisconsin, Madison, Wis.
Election of Section Officers.

SECTION ON SMALL ANIMAL PRACTICE

FIRST SESSION

Wednesday, August 18, 1926. 9:00 A. M.

Chairman's Address—Dr. J. C. Flynn, Kansas City, Mo.

Secretary's Report—Dr. Harry W. Brown, Fort Wayne, Ind.

1. Some Studies in the Behavior of Malignant Growths in
Dogs and Horses—Dr. George W. Little, New York,
N. Y. Discussion by Dr. A. T. Kinsley, Kinsley Labora-
tories, Kansas City, Mo.

Section on Small Animal Practice



DR. J. C. FLYNN
Practitioner
Kansas City, Mo.
Chairman



DR. HARRY W. BROWN
Practitioner
Fort Wayne, Ind.
Secretary

2. Fright Disease—Dr. J. C. Wright, Atlanta, Ga. Discussion
by Lloyd H. Middaugh, Memphis, Tenn.
3. Black Tongue—Dr. C. C. Rife, Atlanta, Ga. Discussion by
Dr. J. T. Jennemann, St. Louis, Mo.
4. Diagnosis and Treatment of Skin Diseases—Dr. H. J. Milks,
New York State Veterinary College, Ithaca, N. Y. Dis-
cussion by Dr. S. W. Haigler, St. Louis, Mo.

SECOND SESSION

Thursday, August 19, 1926. 9:00 A. M.

1. Special Features of Small Animal Practice—Dr. J. G. Horning, Houston, Texas. (Illustrated.) Discussion by Dr. H. W. Ayers, Oklahoma City, Okla.
2. Some Phases of Canine Distemper—Dr. Ashe Lockhart, Kinsley Laboratories, Kansas City, Mo. Discussion by Dr. George W. Little, New York, N. Y.
3. Rabies—Dr. A. H. Williamson, Auburn, Ala. Discussion by Dr. C. R. Walter, Tulsa, Okla.
4. Studies on the Toxicity of Tetrachlorethylene, a New Anthelmintic—Drs. A. S. Schlingman and O. M. Gruzhit, Medical Research Laboratories, Parke, Davis & Co., Detroit, Mich. (Illustrated.) Discussion by Dr. E. K. Glover, Kansas City, Mo.

Election of Section Officers.

GENERAL SESSION

Wednesday Evening, August 18, 8 P. M.

1. Breeding Operations in the United States Army—Capt. Raymond I. Lovell, Depot Veterinarian, Army Remount Depot, Front Royal, Va.
2. The Inheritance of Coat Colors in Domestic Live Stock—Prof. W. S. Anderson, University of Kentucky, Lexington, Ky.
3. Inherited Defects of Live Stock—Drs. F. B. Hadley and B. L. Warwick, University of Wisconsin, Madison, Wis.
4. Some Observations on the Oestrous Cycle and Reproductive Phenomena of the Horse—Drs. H. S. Murphey and W. A. Aitken, Iowa State College, Ames, Iowa.

CLINICAL DEMONSTRATIONS

Friday, August 20, 1926. 2:00 P. M.

SECTION ON SMALL ANIMAL PRACTICE

1. Abdominal Surgery—Dr. Wm. M. Bell, Nashville, Tenn.
2. Cecectomy—Dr. George W. Little, New York, N. Y.
3. Bronchoscopic Clinic—Dr. J. G. Horning, Houston, Texas.
4. Restraint and Methods of Medication—Dr. W. G. Brock, Dallas, Texas.
5. Spaying—Dr. J. C. Flynn, Kansas City, Mo.
6. Ventriculochordectomy—Dr. F. R. Whipple, Peoria, Ill.

SECTION ON GENERAL PRACTICE

(This program to be announced at the meeting.)

APPLICATIONS FOR MEMBERSHIP

(See April, 1926, JOURNAL)

FIRST LISTING

- AYER, JOHN 231 W. 2nd St., Xenia, Ohio.
D. V. M., Cincinnati Veterinary College, 1918
Vouchers: Leonard W. Goss and Russell E. Rebrassier.
- BURKE, JOHN W. Div. of Health, Cappel Bldg., Dayton, Ohio.
D. V. M., Ohio State University, 1923
Vouchers: Leonard W. Goss and Russell E. Rebrassier.
- CARR, FRANK L. 171 W. Oxford St., Alliance, Ohio.
D. V. M., Ohio State University, 1906
Vouchers: Leonard W. Goss and Russell E. Rebrassier.
- EBRIGHT, B. NORMAN Mifflintown, Pa.
V. S., Ontario Veterinary College, 1912
Vouchers: E. L. Stubbs and T. E. Munce.
- ELLIOTT, H. O. Orland, Ind.
D. V. M., Indiana Veterinary College, 1918
Vouchers: R. C. Julien and Frank H. Brown.
- FAILING, GEORGE E. Paw Paw, Mich.
D. V. M., Grand Rapids Veterinary College, 1912
Vouchers: O. H. Core and B. J. Killham.
- HEDGES, N. D. New Capitol Bldg., Frankfort, Ky.
D. V. M., Indiana Veterinary College, 1921
Vouchers: D. E. Westmoreland and W. F. Biles.
- HOWLAND, S. T. 19 Whidden Ave., Whitman, Mass.
V. M. D., University of Pennsylvania, 1914
Vouchers: Harrie W. Peirce and Lester H. Howard.
- HUTCHINS, MARTIN LUTHER Rock Glen, Pa.
V. M. D., University of Pennsylvania, 1916
Vouchers: T. E. Munce and H. R. Church.
- MILLER, R. A. 964 No. Oxford St., Indianapolis, Ind.
D. V. M., Indiana Veterinary College, 1917
Vouchers: R. C. Julien and E. V. Alexander.
- MONTFORT, ELLIS L. Morrisville, N. Y.
D. V. M., Cornell University, 1920
Vouchers: H. E. Marsh and J. L. Wilder.
- PAULISH, W. F. Franklin, Ind.
D. V. M., Indiana Veterinary College, 1916.
Vouchers: C. C. Donelson and R. C. Julien.
- RENFREW, JAMES ROBERT 1017 E. 15th St., Kansas City, Mo.
D. V. M., Grand Rapids Veterinary College, 1911
Vouchers: Ashe Lockhart and J. D. Ray.
- TALBERT, MELLIS GRANT Morristown, Ind.
D. V. M., Indiana Veterinary College, 1915
Vouchers: Frank H. Brown and Wm. D. Gordon.
- TYLER, N. B. 320 Agricultural Bldg., Raleigh, N. C.
D. V. M., Alabama Polytechnic Institute, 1921
Vouchers: A. A. Husman and W. C. Dendinger.
- WAGNER, CLIFFORD C. 83 Fleck Ave., Newark, Ohio.
D. V. M., Ohio State University, 1926
Vouchers: Leonard W. Goss and Russell E. Rebrassier.
- WOODWARD, G. T. Fallon, Nev.
B. S., D. V. M., Washington State College, 1924
Vouchers: Edward Records and Geo. E. Bamberger.
- YOUNG, SAMUEL TAYLOR Middleburg, Va.
V. M. D., University of Pennsylvania, 1903
Vouchers: Robt. E. Ferneyhough and John W. Adams.

Applications Pending

SECOND LISTING

Berger, Robert Lewis, Hamburg, Pa.
Briggs, Carl Lytle, R. F. D. No. 3, Waterford, Pa.
Caswell, F. E., North Adams, Mich.
Coburn, Don R., Box 151, Cassopolis, Mich.
DeGroot, A. H., 223 Tecumseh St., Dundee, Mich.
Dettman, Fred H., 216 E. Main St., Troy, Ohio.
Dickie, D. H., Lawton, Mich.
Dunn, Alexander R., 513 So. Washington Ave., Lansing, Mich.
Elzinga, Herbert, Marne, Mich.
Erickson, Alfred E., 216 So. Washington St., Charlotte, Mich.
Evans, Claude D., 130 Bayard St., Kane, Pa.
Folsom, Edward Graham, Jr., 1248 Frank St., Detroit, Mich.
George, Albert Edward, Perry, Mich.
Herriott, Harry William, R. D. No. 3, McDonald, Pa.
Homiller, John P., Hatboro, Pa.
Hunter, James M., 15 East St., New Milford, Conn.
Jandernoa, Anthony V., Pewamo, Mich.
Kinmond, George Herman, 1844 No. Park Ave., Philadelphia, Pa.
Little, Robert George, 515 Market St., Williamsport, Pa.
McConn, Frank Joseph, Fayetteville, Ohio.
McCulloch, E. C., University of Illinois, Urbana, Ill.
Miller, William Sheeler, 18 8th Ave., Haddon Heights, N. J.
Myers, Floyd E., Gladwin, Mich.
Nugent, William Kemp, 113-04 93rd Ave., Richmond Hill, N. Y.
Robbins, Josiah C., Bay Shore, L. I., N. Y.
Rogers, John Allyn, Bustleton, Philadelphia, Pa.
Schnelle, Gerry B., 184 Longwood Ave., Boston, Mass.
Strockbine, James Kennedy, 268 So. 38th St., Philadelphia, Pa.
Tunncliff, Everett A., University of Illinois, Urbana, Ill.
Van Zoeren, William, Vriesland, Mich.
Veenstra, John Y., R. R. No. 10, Grand Rapids, Mich.
Waddell, R. A., Concord, Calif.
Wharton, Franklin Swiggett, Dover, Del.
Wright, Willard H., Elkton, Md.

The applications of the following are also pending and will be presented to the Executive Board for action at the Lexington meeting.

Hendriksen, Alfred, Burlington, Wash.
Huffman, Robert P., Box 733, Wilmington, N. C.
Miller, S. T., 502 So. Wenatchee, Wenatchee, Wash.
McIntosh, G. E., 309 Central Ave., Louisville, Ky.
Whitehill, N. H., 239 E. Sycamore St., Greensboro, N. C.

REINSTATED

Fleming, W. B., 12 Washington Ave., Montgomery, Ala.
Goodrich, E. C., R. 2, Box 314A, Kalamazoo, Mich.
Hornaday, W. A., Greensboro, N. C.
White, T. W., Malad, Idaho.

The amount that should accompany an application filed this month is \$7.08, which covers membership fee and dues to January 1, 1927, including subscription to the JOURNAL.

Dr. Hans Theiler, son of Sir Arnold Theiler, is at Cornell University under a traveling scholarship from the International Education Board. He is studying in the Department of Pathology and Bacteriology, New York State Veterinary College.

COMING VETERINARY MEETINGS

Northwestern Veterinary Medical Association. Victoria, B. C. Aug. 2-3-4, 1926. Dr. W. Graham Gillam, Hon. General Secretary, Cloverdale, B. C.

San Diego-Imperial Veterinary Medical Association. San Diego, Calif. Aug. 3, 1926. Dr. W. G. Oliver, Secretary, 3821 Arizona St., San Diego, Calif.

Connecticut Veterinary Medical Association. Bridgeport, Conn. Aug. 4, 1926. Dr. Geo. E. Corwin, Secretary, 11 Warrenton Ave., Hartford, Conn.

Chicago Veterinary Society. Great Northern Hotel, Chicago, Ill. Aug. 10, 1926. Dr. J. B. Jaffray, Secretary, 2956 Washington Blvd., Chicago, Ill.

Ontario Veterinary Association. Prince George Hotel, Toronto, Ont. Aug. 11-12, 1926. Dr. H. M. LeGard, Secretary, 223 Main St. N., Weston, Ont.

Kansas City Association of Veterinarians. New Baltimore Hotel, Kansas City, Mo. Aug. 17, 1926. Dr. J. D. Ray, Secretary, 400 New Centre Bldg., Kansas City, Mo.

American Veterinary Medical Association. Phoenix Hotel, Lexington, Ky. Aug. 17-18-19-20, 1926. Dr. H. Preston Hoskins, Secretary, 716 Book Bldg., Detroit, Mich.

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York, N. Y. Sept. 4, 1926. Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.

Georgia State Veterinary Association. Atlanta, Ga. Sept. 8-9, 1926. Dr. Peter F. Bahnsen, Secretary, 121 State Capitol, Atlanta, Ga.

Pennsylvania State Veterinary Medical Association. University of Pennsylvania, Philadelphia, Pa. Sept. 15-16, 1926. Dr. H. R. Church, Secretary, B. A. I., Harrisburg, Pa.

Indiana-Illinois Veterinary Medical Association. Washington, Ind. Sept. 17, 1926. Dr. Frank M. Tade, Secretary, Vincennes, Ind.

Massachusetts Veterinary Association. American House, Boston, Mass. Sept. 25, 1926. Dr. H. W. Jakeman, Secretary, 44 Bromfield St., Boston, Mass.

Eastern Iowa Veterinary Association. Hotel Montrose, Cedar Rapids, Iowa. Oct. 6-7, 1926. Dr. John B. Bryant, Secretary Mount Vernon, Iowa.

A STUDY OF VITAMIN MINERAL MIXTURES AND VITAMIN PRODUCTS IN FEEDING FARM ANIMALS

By L. A. MAYNARD

*Dept. of Animal Husbandry, N. Y. State College of Agriculture,
Ithaca, N. Y.*

Within the past few years there has developed an increasingly flourishing business in the sale of various proprietary preparations, represented as needed for supplementing commonly fed rations in order that farm animals may be completely nourished, and claimed to produce marked results in greater production and better health. It is the purpose of this paper to consider the usefulness of these preparations from the standpoint of the animal husbandman.

Chief among these proprietary preparations are the mineral mixtures. There are a dozen or more mineral elements, a continuous supply of which is essential to the animal body. However, no ration is entirely lacking in any of these necessary elements and most of them are supplied in such amounts in the common feeds that no ration otherwise satisfactory will be lacking in them. Thus, most of these elements may be forgotten as far as nutrition is concerned. However, there are five that do require consideration. Two of these, sodium and chlorine, the constituents of common salt, must always be added to rations as is well understood. Two others, calcium and phosphorus, are not supplied in sufficient amounts in certain rations, depending upon the feeds used. The fifth element that may require consideration is iodine. This element is very low in the soil and water and thus in the crops in certain areas, and a lack of it has been found responsible for the birth of hairless pigs and for goiters in newborn calves, lambs and foals.

The fact that the list of minerals that may serve a useful purpose as supplements to practical rations is limited to five, leads to the first criticism that must be made of the common type of proprietary mineral mixtures on the market. It supplies many substances in addition to those than can possibly be needed. Common ingredients of such mixtures are Epsom salt (magnesium sulfate), Glauber's salt (sodium sulfate), copperas (ferrous

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sulfate), potassium chlorid, and sulfur. There is no evidence that the magnesium, potassium, iron, and sulfur supplied by these compounds have any nutritional value when added to common farm rations.

It is claimed that certain of these substances have a medicinal value. Epsom salt and Glauber's salt are claimed as useful ingredients because of their laxative and purging action. From the standpoint of animal husbandry it is believed that the best way to make a ration laxative is through a proper selection of the common feeding stuffs. This is easily done. When an animal becomes constipated so as to require a purgative, the small amount contained in the usual feeding of a mineral mixture cannot possibly have any effect. It is not believed that the constant feeding of laxatives serves any useful purpose and it may prove harmful rather than beneficial.

Worm remedies are frequent ingredients of proprietary mineral mixtures for swine. Copperas and other materials are included as blood purifiers. Various tonic materials are also frequent ingredients. All of these may have a place in veterinary medicine. However, it seems a reasonable point of view that when an animal is well it does not need medicine, that when it is sick it needs the specific treatment for its disease, that a shot-gun prescription of a variety of drugs constantly fed has no justification, and that it may prove harmful rather than beneficial.

In support of this point of view the following is quoted from the Michigan Expt. Sta. Quarterly Bulletin, May, 1925: "Results at this station, where heifers are being fed a complex mineral mixture in addition to a basal ration, show that a mineral mixture may be harmful to dairy heifers when fed over a long period at the rate of 2 oz. per day." The mixture used contained Epsom salt, Glauber's salt, copperas and sulfur.

The second objection to these proprietary mineral mixtures is their cost. When a farmer can purchase a high quality bone meal, the best source of calcium and phosphorus, for feeding purposes, at \$60 per ton and salt at a small fraction of this figure, he is not justified in paying \$80 to \$120 a ton for a complex mineral mixture in which the needed minerals are diluted with an unknown amount of useless materials.

In the third place, most of these complex mineral mixtures are not accompanied by any guarantee as to the amount of calcium and phosphorus or other needed minerals present, nor as to the form in which they are supplied. The latter is particularly

important because the source of a mineral for feeding purposes must be carefully selected to avoid materials that may carry disease or contain harmful impurities.

There is no objection to a proprietary mineral mixture provided the farmer can be certain of getting the mineral elements he needs and those only, supplied from high-grade sources, and at a reasonable price. Such a mixture should be limited to sources of calcium, phosphorus, salt and iodine. The farmer who needs to feed all these minerals may consider it advantageous to buy them ready mixed, but he must know just how much he is getting of each mineral and what its source is, so that he can tell whether the cost is right. He must expect to pay more for the mixture than for the straight ingredients, but he cannot afford to pay bone-meal prices for salt.

It has been clearly proved that the addition of the bone-forming minerals, particularly calcium, to many of the rations fed in New York State is beneficial. Time does not allow the detailing of the various conditions under which extra sources of these minerals should be added to the ration. A rather wide-spread condition where the addition of calcium is needed is for high-producing dairy cows fed little or no legume roughage. The same mineral is needed as a supplement to the swine ration which does not contain liberal amounts of skimmilk or is not properly balanced with tankage or other bone-carrying feed as the high protein constituent.

The proven effects of proper calcium and phosphorus nutrition are better bone development in growing animals, prevention of cripples in swine, and milk production with less drain upon the body and apparently a longer productive life for our milking animals.

The claim is frequently met that the feeding of minerals will prevent or cure abortion and the nutrition specialist is occasionally credited with sharing this view. There is experimental evidence that deserves careful consideration that reproduction troubles are less frequent under conditions of adequate calcium and phosphorus nutrition than otherwise, and this is a question that deserves further study, particularly with careful bacteriological control.

However, any such beneficial effect must be limited either to the development of an increased resistance to infection as the result of a better state of nutrition or to the prevention of certain possible cases of abortion that occur without infection when the

animal is in a very depleted nutritional state. It is foolish to consider that inadequate nutrition with respect to calcium and phosphorus is responsible for the present prevalence of abortion or that either one of these elements has only specific curative effect. There is no justification for the feeding of mineral supplements solely from the standpoint of their influence on reproduction troubles nor for any claim that such troubles will be prevented or cured by such a feeding practice.

Another class of special preparations that are marketed for animal feeding are various sources of vitamins. The recently discovered knowledge as to the necessity of a proper supply of the vitamins for humans and laboratory animals and the deficiency of these substances in many human dietaries has led to the assumption that these vitamins have the same importance in the nutrition of farm animals—an assumption which must be considered to a large degree as unproved or untrue.

In the first place, it should be remembered that the different species differ in their requirements for the various vitamins. Specifically, the growing child and guinea pig must have a relatively large and constant supply of vitamin C in their diet, but experiments have shown that the rat, chicken and pig apparently do not need this vitamin at all.

In the second place, it must be borne in mind that as a class, animal feeds are much richer in most of the vitamins than are human foods. The processes of food preparation and manufacture which have made human food poorer in vitamins, for example, the milling of cereals, have enriched the by-products which are fed to animals. Thus the consideration of vitamins in the feeding of farm animals is of much less practical importance than in the case with humans because their feed is naturally richer in these substances.

Further, leafy foods, rich in vitamins, form a much larger proportion in the ration of farm animals than in the human dietary.

According to the best information now available there is no danger of a lack of vitamins A, B and C in the rations of cows, sheep or horses. The same is true for swine and poultry as regards vitamins B and C. There is some evidence that pigs and chickens may suffer from a lack of A with certain rations, but this deficiency is easy to overcome by a proper selection of the ration from the common feeding stuffs in their diet. The need of any

class of farm animals for a given vitamin cannot be assumed. It must be specifically proved. Certainly there is no need for the purchase of any special sources of either vitamin A, B, or C, for farm animals and any such purchase must be considered a waste of money. There is no justification for feeding yeast as a source of vitamin B.

A different situation is met in the case of vitamin D. This is the vitamin that aids mineral assimilation. Its best source is cod-liver oil. The value of feeding cod-liver oil to chickens and laying hens is well established, both by experiments and practice. Its usefulness in curing rickets in swine and in other animals is also well known. Adding cod-liver oil to the swine ration is also beneficial as a preventive of rickets. However, it is entirely possible to select a ration for swine from the common feeds that will provide for proper mineral assimilation and thus the regular feeding of cod-liver oil must be considered unnecessary and uneconomical.

Theoretically, the feeding of cod-liver oil should be advantageous in the case of heavily milking dairy animals, since repeated experiments have shown that such animals do not assimilate enough calcium and phosphorus to provide that needed in their milk, at least during the first part of their lactation, but rob their bones of these elements instead. Such a procedure appears physiologically wrong and one which must have a detrimental effect on health and production. However, for some reason not yet understood the dairy cow is not as responsive to the feeding of cod-liver oil as are other animals. Thus, on the basis of present knowledge, such a practice cannot be considered economical or effective.

It must be recognized that the knowledge regarding vitamin D is very recent and that present ideas may be modified by future studies.

There is no information as to the practical importance for farm animals of the newly discovered vitamin E, which is apparently related to fertility.

There is an influence of vitamins in animal feeding that has not been mentioned, namely, the influence on the vitamin content of the product. For example, milk from cows on pasture is much richer in vitamin C than is winter milk because pasture grass is rich in this vitamin while dry roughage contains little of it. Similarly the vitamin content of eggs is influenced by the feed of

the hen. These facts are of practical importance from the standpoint of human nutrition, but the stockman cannot be expected to give them much consideration unless the product with the higher vitamin content will bring a sufficiently higher price to justify feeding the animals accordingly.

The foregoing survey indicates that the only vitamin preparation that the stockman is justified in buying is cod-liver oil, and that the regular feeding of the material is of proven economic value only in the case of chickens. It must be remembered that cod-liver oil acts by rendering the calcium and phosphorus in the ration more effective. It does not replace these minerals. Cod-liver oil should be purchased preferably as such rather than combined with any other feed or with a mineral mixture. It gradually loses its activity when combined with other materials.

The recognition that there are conditions when certain mineral and vitamin preparations are needed should not cause the farmer to neglect the other factors in a complete ration. Many farmers whose animals are in poor condition or failing in production are being induced through clever salesmanship and advertising to pay exorbitant prices for a complex proprietary mineral mixture or tonic and are feeding it by the spoonful when all their animals really need is another pound or two of real food. The correct feeding practice is first to make sure that the ration contains plenty of protein and total digestible nutrients, selecting the ingredients so as to meet the mineral and vitamin requirements in so far as possible from the available feeds, and then to consider what supplements may be needed to complete these requirements.

NEWS ITEMS

The Board of Health of Kenton, Ohio, has made a ruling that all milk sold in Kenton must be from cows that have successfully passed a tuberculin test.

The Board of Health of Fostoria, Ohio, has adopted an ordinance prohibiting owners of dogs taking the latter into places where food for human consumption is on sale.

The June number of the *Country Gentleman* contained an unusual and delightful short story, entitled "Hair Trigger," by Barker Shelton, in which a young veterinarian played the leading rôle.

SOME OF THE NEWER PROBLEMS IN VETERINARY SCIENCE*

By S. J. SCHILLING, Fayetteville, Ark.

Arkansas State College of Agriculture

The problems confronting the veterinary profession today are partly economic and social, as well as scientific in nature. The economic problems are at present giving the practitioner the greatest concern, since they influence directly his material prosperity. Scientific problems also are attracting, and must continue to attract, the attention of the veterinarian. We are met today primarily to consider scientific matters in our field. The object of this paper is to present and analyze some of the more recent questions which have been engaging the attention of members of the veterinary profession. It is futile to recognize problems without attempting their solution. Therefore, an endeavor is also made to define a proper attitude of the veterinarian toward the special conditions with which he is being confronted.

In some cases it will be found on analysis that what appear to be new problems are but old vexations in new guises. Other complications which have arisen belong more distinctly to the age in which we are living. The economic and social problems of the veterinary profession relate directly to and are the outgrowth of changing economic and social conditions, changes in the country at large and changes more primarily in agriculture. Veterinary medicine is a cog in the wheel of agriculture. While veterinary medicine also plays a leading rôle in the protection of human health in safeguarding that part of our food supply which is of animal origin, and while the profession is active in the promotion of humane practices toward animals, the veterinary practitioner is tied quite directly to the soil. As agriculture prospers, so may he expect to prosper; when agriculture is in a slump the veterinarian may expect poor fare. Economic practices and social movements in the agricultural population also react on the welfare of the veterinarian. It follows, then, that in the realm of agriculture we must look for the causes of those untoward conditions which have arisen.

*Presented at the twenty-first annual meeting of the Arkansas Veterinary Association Little Rock, January 21, 1926.

The following factors, which may be observed in the agricultural life of the State, are the most prominent and most prolific sources of disturbed conditions for members of the veterinary profession, particularly of the small-town or rural practitioner. Nothing that is said herein should be taken as a reflection on Arkansas, since the conditions are rather general throughout the country. The discussion is applied specifically to our State, however, for the sake of emphasis and clarity. Some of the conditions are in our control, others are not. To recognize our problems, however, helps us to meet them with a greater degree of poise and a greater hope of success. These problems, which of necessity become ours by virtue of our association with agriculture, are:

1. The depression in the value of agricultural products.
2. The large volume of borrowed capital for agricultural purposes and the high rates of interest.
3. The spirit of unrest among the agricultural population.
4. The lack of appreciation of science.
5. The backwardness of large masses of population.
6. The Texas fever tick.

Depression in agricultural values: Agriculture has recovered to some extent from the serious depression in the value of farm products which occurred in 1920. Even today, however, the prices of farm products are 25 per cent below the pre-war period, as compared with the cost of materials the farmer must purchase. Since the farmer must use proportionately more of his income for immediate necessities of life and tools of production, he has less money for other expenses of his enterprise, and on this account the business of the practitioner suffers. Furthermore, the numbers and values of farm animals in Arkansas have declined greatly in the last ten years. This has resulted in an unfavorable position for the practitioner. Inevitably it has led to a situation where less demand for veterinary service exists and where the low value of the animal makes the farmer less likely to engage skilled services even in cases of severe emergency. The comparative numbers and values of farm animals in Arkansas in 1915 and 1925 are presented in table I.

Borrowed capital and interest charge: The farmers of Arkansas operate on loan-and-credit capital amounting to about \$150,000,000. This costs them about 10 per cent as interest charge. Relatively few lines of business yield a return of 10 per cent for the investor, and farming is not one of them, except in times of

TABLE I—*Farm value of domesticated animals*

	1915			1925		
	NUMBER	VALUE PER HEAD	TOTAL VALUE	NUMBER	VALUE PER HEAD	TOTAL VALUE
Horses	276,000	\$76.00	\$20,976,000	218,000	\$41.00	\$ 8,938,000
Mules	240,000	96.00	23,040,000	328,000	63.00	20,664,000
Milk cows	387,000	37.00	14,319,000	516,000	25.00	12,900,000
Other cattle	484,000	17.20	8,324,000	402,000	8.70	3,497,000
Sheep	130,000	2.60	338,000	80,000	3.80	304,000
Swine	1,573,000	6.50	11,224,000	847,000	8.00	6,776,000
Total			\$78,221,000			\$53,079,000
Decrease in value, 1915-1925						\$25,142,000
						33%

rapidly-rising farm values. Thus, the present credit-and-loan situation is a drain on agriculture and prevents that degree of prosperity which the veterinarian would share in return for his services in a less burdened type of agriculture.

Spirit of unrest: The press of this country is giving much prominence to agitation, largely fostered by professional politicians, for farm-relief legislation. So-called farmer organizations frequently call attention to the wide-spread difference between farm prices of products and the prices the consumer pays. Other movements are afoot to create among the farmers a class spirit and a distrust of those who, in serving the farmer, derive a just recompense for their services. In some states on this account the veterinarian has suffered severely in prestige and curtailment of business. While legislation has its place in encouraging agricultural development, yet the farmer cannot expect the passage of laws to make him wealthy or cure his ills. The retailer has his place in our economic system and so has the professional man. Our solid farm folks know that it is not legislation, discontent and suspicion, but rather hard work, careful planning, following sound lines of production, and the elimination of waste that make for success on the farm. And the elimination of waste in so many instances requires the services of a qualified veterinarian.

Lack of appreciation of science: Science and the lessons science has to teach us permeate the general population but slowly. But for science, we would have today no automobile and no locomotive. But for science, electricity and its use would be unknown. But for science, there could be no vaccination for typhoid nor for anthrax, for small pox nor for hog cholera. Where can you turn and not see the influence of science in our daily lives? Yet large numbers of farmers do not appreciate science sufficiently to follow its guidance in the selection of fertilizer, the planning of a rotation, or the tillage of a soil. Those who are not ready to follow science in this field may hardly be expected to call in science, in the personage of a qualified veterinarian, to combat a menace of disease. More extensive education for the common people is necessary for their advancement in this respect. Each year I have the good fortune to direct the studies of a group of young men in our State University. I feel I would be neglecting an opportunity if I did not impress them with the fact that veterinary science is not a juggling of recipes and on recipes we do not dwell. Veterinary science is a

branch of natural science and he who does not know the natural laws that are operating in a case he is treating is an empiric. Were Mother Nature not so kind in providing the animal body with natural powers to eliminate disease, the empiric, whoever he may be, would be completely discredited and the farmer would turn more fully to the veterinarian for help and guidance.

Backwardness of population: Practically all communities have progressive citizens whose ideals and whose energies are bent toward advancement and a bigger life. They realize that they must be producers of wealth before they can be consumers, and they so shape their farm enterprises that they may enjoy in good measure the blessings of our civilization. These folks will be found among the veterinarian's best clients. If the same ideals and the same urge for progress were universal, rural conditions would be much improved. The lack of sufficiently wanting to know, and to have, of wanting to do and to be, retards the development of many persons and is a drag on those whose life and life work is in the same community. Education and escape from provincialism will supply the means to remedy the situation.

Texas fever tick: The Texas fever tick still remains as a retarding factor on the agriculture of a large, though rapidly decreasing, portion of Arkansas. The economic waste it produces and the obstacle it interposes between the introduction of well-bred cattle are known to you. Those in charge of eradication are to be congratulated on the progress that is being made. Completion of the eradication program will be a boon to agriculture and to all industries, business and professional life in the State.

The foregoing are the most important economic problems of the Arkansas farmer and thus, incidentally, of the Arkansas veterinarian. In these times of decreasing enrollments at veterinary colleges and of veterinarians leaving the ranks of the profession, some ask the question. "What is the matter with the veterinary profession?" We should, however, look deeper and ask, "What are the difficulties that beset agriculture?" These difficulties reflect a change in conditions and individuals can do little to alter them; a mass movement of a people usually runs its course in spite of attempts to the contrary. To meet these conditions a veterinarian requires the qualities of adaptability, integrity, social spirit, competence, helpfulness, and fair dealing; hard work and long residence in a single community are distinct assets. To the man who embodies the afore-

mentioned qualities, a dissertation on them is unnecessary and, to the man who has them not, it would be equally wasted. In the final analysis, it is an individual problem which varies according to the man, according to the community, and according to the times which the veterinarian has to face. While some complain and drop out of the ranks, others are succeeding. In leaving this phase of the discussion, it may be said that while Arkansas may never, and surely in our lifetime will not, become primarily a live stock state, there is no reason to doubt that the future will see a great increase in the numbers and in the value of live stock and Arkansas will require and provide a fair field of labor for the competent veterinarian.

SCIENTIFIC PROBLEMS

While the veterinary profession shares the effects of the social and economic problems of the agricultural population, it has scientific problems of its own. The veterinary profession is founded on the natural sciences. The knowledge of the special fields of natural science which the veterinarian has is what makes him a veterinarian, gives him his prestige, his recognition in the eyes of the law, draws his clientele, and defines his field of service. A fuller understanding of the laws of Nature will increase his opportunities for recognition and for leadership. This implies a better knowledge of established facts and the search for new truths.

The problems which are engaging the attention of veterinarians in research fields are of interest to the practitioner, and a few will be mentioned here. Some of these problems are not of immediate interest to Arkansas veterinarians, since conditions here differ from those in some parts of the country. Yet we never know when the problems of our neighbors in the field of animal disease may become our own as well, and as scientific men our interests should be somewhat general.

It would be a splendid thing if once a year we held a more protracted session of our body, at which time we would have opportunity to have brought to us a refreshing of our knowledge, a stimulus to keen thinking, and a presentation of the newer developments in science as applied to our field, by specialists from outside of our group. I am referring to the desirability of some form of a veterinary short course.

For the present, I should like to give some consideration to new work in tuberculosis, abortion disease, parasite control, poultry diseases, and preventive medicine.

Tuberculosis: The war on tuberculosis is proceeding as rapidly as might be expected in such a stupendous and laborious undertaking. Over 13,000,000 head of cattle in the United States are under the supervision and the provisions of the accredited-herd and area-eradication plans. Over 3,500,000 more are on the waiting list. Since there are 65,000,000 head of cattle in the United States, it may be seen that tuberculous associates have been or are being removed from about 20 per cent of the cattle of this country. This work has sustained the reliability of the tuberculin test and the efficacy of slaughter of infected animals and disinfection of premises, in spite of powerful critical agitation.

A new hope has arisen regarding means of the control of tuberculosis. Much experimental work has been done in the past on therapeutic agents for and vaccines against this disease. The most encouraging promise in this field has come through the work of Calmette, in France. Calmette attenuated tubercle bacilli by growing them in a bile medium, so that they will serve as a vaccine. The vaccine does not cause tuberculosis in vaccinated animals, and it seems to give protection against the disease for about one year. It is not a cure; Calmette himself says that when the vaccine is used on animals that are already infected it aggravates their condition. Furthermore, the attenuated bacilli which the vaccine contains remain alive and multiply for some time in the vaccinated animal. I have no wish to discount the work of this investigator, but feel the position of Dr. John R. Mohler, Chief of the Federal Bureau of Animal Industry, is to the point. Dr. Mohler says:

What we should remember, in connection with the milk supply, is that the vaccine cannot purify the milk of already tuberculous cows, though it may prevent the spread of the disease from them to other cattle with which they are associated. We should also remember that a tubercle bacillus, which has changed its character through methods of artificial cultivation, may reacquire its original, and in this case dangerous, character after a protracted residence in its customary or normal environment, especially because tubercle bacilli, even when they are dead, are destroyed or disappear from living animal tissues very slowly. Another statement made by Calmette is of considerable importance. It is that the vaccine, although it protects against tuberculosis, does not lead to the rapid or complete destruction of living tubercle bacilli that may enter the bodies of vaccinated animals.

The position of the Bureau may be stated as follows: If the Calmette vaccine can be used to eradicate bovine tuberculosis, the fact must be determined. Efforts to determine it are actively in progress. But, until it has been determined, and it has been proved that the use of the vaccine is free from serious dangers, neither the wide publicity it has received nor the authority of Calmette should lead to an official approval of its use, or its substitution for our present method of eradicating bovine tuberculosis.

Further information is constantly coming to light that our earlier views regarding the existence of three distinct types of

tubercle bacilli—avian, bovine, and human—were in need of qualification. The demonstrations of intertransmissibility from one species of animal to another are multiplying, though they indicate that the infection of cattle with avian tubercle bacilli does not lead to as serious a type of the disease as is otherwise found.

Abortion disease: The abortion disease is not a primary problem in Arkansas. However, unless we are on our guard it may become more serious in our herds. The past year has seen no very important additions to our knowledge in this field. Sanitary control measures have proven their value in eliminating the disease from infected herds. Vaccines and vaccination have their adherents, especially in dealing with non-pregnant females, and attenuated-live-culture vaccines are in the lead in receiving attention from laboratory workers. Since abortion disease is self-limiting in character, and since it yields to sanitary control, the actual value derived from the field use of vaccines or other measures of control are difficult to measure.

Other established points regarding infectious abortion are: Ingestion is probably the most usual means of infection. However, the fact that infection may readily take place when cultures of the abortion bacillus are placed in the conjunctival sac suggests that there may be other important portals of entry. The bull is not the most serious offender in the transmission of the disease. Calves born of infected dams or calves fed milk from infected cows soon eliminate the disease germs from their systems, and do not become reinfected until of breeding age; thus it is possible to raise a clean herd from an infected one. The standardization of blood tests for abortion disease will be necessary to a more successful use of this means of protecting the owner of a clean herd. The work of standardizing blood tests is being pursued by cooperative work of five of our leading experiment stations.

Parasite control: The external parasites of domestic animals are fairly well known and control measures, except in the case of flies and mosquitoes, are quite satisfactory. The internal parasites, however, present a more acute and complex problem which is nation-wide. The mild winters of Arkansas, the one-crop system with permanent pastures, and the close grazing in the dry, summer months intensify the problem in this state. Unfortunately the literature on parasites is rather confusing; there are so many remedies suggested; each writer appears to

list all lines of treatment that have ever been suggested. Some of these are absolutely worthless. The practitioner has no opportunity to test the efficacy of each, and does not know which to choose. This condition should be remedied by the determination of the more effective parasiticides and the elimination of those which have no value from our literature. Unfortunately for the farmer and for the rural practitioner, the present work on parasites is largely on foxes and dogs; parasites of large animals deserve more attention and study.

Some recent work at the Arkansas Experiment Station shows that to control the stomach worm of sheep repeated treatments every three weeks from May to November are necessary. A 1 per cent solution of copper sulphate in doses of two ounces to lambs and four ounces to adult sheep is effective when used in this manner, even when sheep are running on infested pastures. Fatalities from stomach worms occurred among infested lambs which received but one treatment and were then turned on clean pastures. That the dose may be doubled without harmful effect shows that the treatment is harmless to the sheep, and it was found that the loss in weight which sheep sustain in being kept off range and water for twenty-four hours at the time of treatment is rapidly regained and does not interfere with growth and development.

The Oklahoma Experiment Station is doing valuable work on the life history of the parasites of nodular disease; more such fundamental research will be necessary to establish parasite control. Preventive measures undoubtedly will be our chief weapon in combating parasites rather than the use of drugs on the infested animal.

Poultry diseases: The diseases of poultry are at present receiving marked attention. This is encouraging, for it is an important line of investigation. As early as 1920 the value of poultry products in the United States exceeded one billion dollars; it exceeded the value of all cattle raised, of wheat, of oats, of fruits and of potatoes and tobacco. An industry of this importance deserves attention to its problems.

White diarrhea is one of the foremost poultry problems. The methods of making blood tests to eliminate hens which are themselves infected and lay infected eggs have not yet been sufficiently standardized. Yet it has already been demonstrated that by eliminating such hens for breeding purposes the mortality of

chicks can be greatly reduced. Sanitary control of incubators, brooders and yards, however, cannot be neglected.

Parasites in poultry merit further study and the roup, pox, diphtheria and canker complex, which is another serious source of loss, should not be neglected.

Preventive medicine: As evidence accumulates, the value of hygienic and sanitary measures in such diseases as hog cholera, parasitism, tuberculosis, abortion, and anthrax are being sustained. Vaccines and biologics generally are gradually approaching a greater standard of reliability. In this connection permit me to state the position of Oscar Bail, one of the foremost investigators of Europe, in the field of anthrax immunity. Dr. Bail found, after long experience with anthrax and anthrax vaccines, that unless an animal develops a swelling at the site of administration of vaccine, no production of immunity in that animal may be hoped for. The experience of the writer at the Arkansas Experiment Station is to the same effect. Anthrax vaccines which frequently fail to produce local reactions are too mild and should not be used.

CONCLUSION

The problems, then, of the veterinary profession are economic and social; they are also scientific in nature. The solution of the former is partly beyond our control, and even though in many instances it may be distasteful to us we will fare better if we make the necessary readjustments to meet conditions. In the long run we need have no fear for the life and plane of existence of the veterinary profession. The scientific alertness of the practitioner, of the veterinary official, and of the research man must not fail. Many problems are being studied but there is a vast field of work to be done. The information thus gathered should be made more available. As we face the solution of our problems on this basis, success awaits us and we can face the future with good heart.

A FATAL CASE

The following combined "newspaper puff" and case report was taken from the Van Buren (Ind.) *News-Eagle*:

"For any kind of veterinary work or surgery or operation or decapitation, call on Dr. Thomas Johnson. He performed an operation Monday on a dead pig and found the case to be a bad one. He states that very few get over the disease, as it thumped itself to death."

TUBERCULIN SENSITIZATION IN GUINEA PIGS CAUSED BY VARIOUS ACID-FAST ORGANISMS

By A. B. CRAWFORD,

*Assistant Veterinarian, Experiment Station of the
U. S. Bureau of Animal Industry, Bethesda, Md.*

From a study of the literature on the subject of tuberculin reactors showing skin lesions only, the possibility that these lesions are in some instances caused by acid-fast organisms other than the bovine tubercle bacillus is suggested by the following facts:

1. Reactors with skin lesions only are at times found in herds in which there is no history of tuberculosis.

2. The acid-fast organisms usually present in skin lesions do not grow on culture media favorable to the growth of mammalian tubercle bacilli, a condition which was encountered in the cultivation of the acid-fast organisms of Johne's disease and leprosy.

3. The reaction to mammalian tuberculin is usually atypical, which suggests a group rather than a specific, mammalian-tubercle-bacillus sensitization.

4. This condition apparently is more prevalent in some localities than in others.

On account of the widespread occurrence of the so-called saprophytic acid-fast bacteria, the idea suggested itself that one or more of these organisms might at times be associated with skin lesions in cattle. The idea is supported by the following: Calmette¹ has submitted evidence to show that the nontoxic, paratubercle bacilli are capable of sensitizing the body; and Long² has demonstrated that frog, grass, and smegma bacilli cause a definite testicular reaction when injected into the testes of tuberculous guinea pigs.

Tests were recently made, at the Experiment Station, of the sensitization to tuberculin caused in guinea pigs by a number of acid-fast organisms, with a view to selecting the types causing the most marked tuberculin sensitization for use in an experiment in cattle in which the subject of skin lesions will be studied. The tests in the guinea pigs revealed many facts relative to the variability of the sensitizing properties of the various acid-

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fast organisms and the results are deemed of sufficient interest to workers in the field of tuberculosis to warrant publication. A description of the work is here given.

TECHNIC

Cultures were obtained of the following acid-fast organisms: Moller timothy-hay bacillus; hog-skin bacillus, milk bacillus, fish bacillus, mist bacillus, grass bacillus, Friedman turtle bacillus, nasal-secretion bacillus, and smegma bacillus. Several of these types, of course, could be eliminated so far as skin lesions in cattle are concerned, but have been included for comparative purposes.

Each of the cultures mentioned was injected into a group of 15 guinea pigs. The dose in each instance was 5 milligrams, moist weight, suspended in 1 cc Ringer's solution, and injected

TABLE I—*Moller acid-fast bacillus. Reactions to intracutaneous injections of avian and mammalian tuberculin. Each guinea pig received an intra-abdominal injection of 5 mg., moist weight, of a pure culture of the Moller acid-fast bacillus, 35 days prior to intracutaneous tests*

GUINEA PIG	TUBERCULIN	REACTION	
		24TH HOUR	48TH HOUR
90559	Avian	None	None
	Mammalian	None	None
90560	Avian	None	None
	Mammalian	Slight thickening of skin	Slight thickening of skin
90561	Avian	None	Slight thickening of skin
	Mammalian	Slight thickening of skin	6-mm. reaction, slightly raised, pinkish, with 2-mm. central area of necrosis
90563	Avian	None	None
	Mammalian	25-mm. area, raised and slightly inflamed, with pale center, 1 cm. in diam.	Slightly resolved; scab forming in center; surrounding tissue pale and thickened
90573	Avian	Skin slightly thickened	Pinkish nodule, 2 mm. in diam.
	Mammalian	1-cm. area, skin raised and slightly inflamed	Contracted; reddish node, 5 mm. in diam.

tions were made intra-abdominally. The average weight of guinea pigs was 450 grams.

After thirty days each group was tested for sensitization in the following manner: Five guinea pigs were injected intra-abdominally each with 2 cc of avian tuberculin per 500 grams weight; five were injected intra-abdominally each with 2 cc of mammalian tuberculin per 500 grams weight; and five were injected intracutaneously each with 0.1 cc avian tuberculin and

TABLE II—*Acid-fast bacillus from hog skin. Reactions to intracutaneous injections of avian and mammalian tuberculins. Each guinea pig received an intra-abdominal injection of 5 mg., moist weight, of a pure culture, 34 days prior to intracutaneous tests*

GUINEA PIG	TUBERCULIN	REACTION	
		24TH HOUR	48TH HOUR
90578	Avian	1-cm. area, raised, slightly inflamed, with pale center	Well-marked reaction, 12 mm. in diam., inflamed, with necrotic center
	Mammalian	1-cm. area, raised, inflamed with pale center	9-mm. area, inflamed, with small necrotic center
90579	Avian	8-mm. area, slightly inflamed with pale center	Small, well-marked, reaction, 8 mm. in diam., very inflamed, with small necrotic center
	Mammalian	Area 1 cm. in diam., skin thickened and slightly inflamed	Small, well-marked reaction, 12 mm. in diam., very inflamed, with necrotic center
90582	Avian	12-mm. area, skin thickened and very slightly reddened	Slightly resolved from preceding day
	Mammalian	12-mm. area, skin thickened and very slightly reddened	3-mm. necrotic center surrounded by 2 mm. zone of inflammation
90583	Avian	Skin very slightly inflamed at site of injection	Practically same as on preceding day
	Mammalian	Skin very slightly inflamed at site of injection	Small central area of necrosis surrounded by a slightly inflamed area, whole reaction only 4 mm. in diam.
90588	Avian	None	None
	Mammalian	Skin slightly thickened	Skin slightly thickened and slightly inflamed

0.1 cc mammalian tuberculin, the avian tuberculin being injected on one side of the abdomen and the mammalian on the other.

Each cubic centimeter of the tuberculins used in intra-abdominal injections contained the equivalent of 0.125 gram of Koch's Old Tuberculin, and each cubic centimeter of the intradermal tuberculins contained the equivalent of 0.25 gram of Koch's Old Tuberculin.

REACTIONS

In none of the groups was a generalized reaction caused by the intra-abdominal injections of either avian or mammalian tuberculin.

TABLE III—*Vermont acid-fast bacillus from milk. Reactions to intracutaneous injections of avian and mammalian tuberculins. Each guinea pig received an intra-abdominal injection of 5 mg., moist weight, of a pure culture of the Vermont acid-fast bacillus, 40 days prior to intracutaneous tests*

GUINEA PIG	TUBERCULIN	REACTION	
		24TH HOUR	48TH HOUR
90592	Avian	None	None
	Mammalian	Well-marked reaction, 16 mm. in diam., central scab 2 mm., surrounded by pale area 1 cm. in diam., with well-defined peripheral zone of inflammation	Resolved to 1-cm. area, raised, inflamed, with central brown scab
90593	Avian	Skin slightly thickened	Practically normal
	Mammalian	An area 5 mm. in diam., slightly inflamed	Skin thickened and indurated. No discoloration
90594	Avian	None	None
	Mammalian	Skin thickened and slightly inflamed	6 mm. area, skin thickened and raised; color normal
90598	Avian	Skin thickened and slightly inflamed	Slight thickening of skin
	Mammalian	Skin thickened and slightly inflamed	Slight thickening of skin
90903	Avian	None	None
	Mammalian	Faintly inflamed area, 15 mm. in diam., with pale central area	Practically same appearance as on preceding day

In order that a comparison may be made of the skin sensitization to tuberculin produced in guinea pigs by the acid-fast organisms, and a specific intradermic tuberculin reaction, a description of the latter is here given. A typical tuberculin reaction at the 24th hour generally shows a raised, diffuse, inflamed swelling, seldom less than 12 mm. in diameter and at times as much as 40 mm., with a central area blanched or showing a tendency to necrose; the reaction does not generally reach its maximum until the 48th hour, when it becomes more defined; the central area has become necrosed and sharply circumscribed, the periphery being slightly congested and surrounded by a definite zone of inflammation. The whole reaction is raised above the surrounding normal skin, being a flat or "plateau" swelling, or slightly mounded. At the 72nd hour, resolution sets in slowly; the central necrotic area becomes a brown scab and a thin layer of epiderm peels from the inflamed zone. A vestige of the reaction is generally present a week later.

Moller acid-fast bacillus: There was practically no reaction to avian tuberculin, while three of the five guinea pigs mani-

TABLE IV—*Fish acid-fast bacillus.* Reactions to intracutaneous injections of avian and mammalian tuberculins. Each guinea pig received an intra-abdominal injection of 5 mg., moist weight, of a pure culture of the fish acid-fast bacillus, 41 days prior to intracutaneous tests

GUINEA PIG	TUBERCULIN	REACTION	
		24TH HOUR	48TH HOUR
90922	Avian	Slight thickening of skin	Skin slightly thickened
	Mammalian	Skin slightly thickened	3-mm. area slightly red- dened
90923	Avian	None	None
	Mammalian	Skin slightly thickened	3-mm. area slightly raised and reddened
90924	Avian	None	None
	Mammalian	Skin slightly thickened	Skin slightly thickened
90925	Avian	Skin slightly thickened	Skin slightly thickened
	Mammalian	Skin slightly thickened	Skin slightly thickened
90928	Avian	None	None
	Mammalian	Skin slightly thickened	Skin slightly thickened

festes somewhat marked though atypical reactions to mammalian tuberculin. (Table I.)

Acid-fast from hog skin: This organism caused the greatest degree of sensitization of any tested. Two of the guinea pigs showed small but rather typical reactions to both avian and mammalian tuberculin; one an atypical reaction to avian and two atypical reactions to mammalian tuberculin. (Table II.)

Vermont acid-fast from milk:* There was no manifestation of sensitization toward avian tuberculin. To mammalian tuberculin one guinea pig at the 24th hour showed a well-marked reaction which had resolved considerably at the 48th hour; two showed rather atypical reactions, and the other two only a thickening of the skin. (Table III.)

Fish acid-fast bacillus: There was very little sensitization for either avian or mammalian tuberculin other than a slight thickening of the skin which seemed slightly more marked with the mammalian. (Table IV.)

TABLE V—*Mist or dung acid-fast bacillus. Reactions to intracutaneous injections of avian and mammalian tuberculin. Each guinea pig received an intra-abdominal injection of 5 mg., moist weight, of a pure culture of the mist bacillus, 42 days prior to intracutaneous tests*

GUINEA PIG	TUBERCULIN	REACTION	
		24TH HOUR	48TH HOUR
90956	Avian	None	Slight thickening of skin
	Mammalian	1-cm. area of skin thickened and faintly reddened	Practically same appearance as on preceding day
90958	Avian	None	Slight thickening of skin
	Mammalian	1-cm. area of skin thickened, slightly mounded and faintly reddened	8-mm mound, with brownish hue
90959	Avian	None	Slight thickening of skin
	Mammalian	Slight thickening of skin	5-mm. mound, with pale center. No reddening
90960	Avian	None	Slight thickening of skin
	Mammalian	12-mm. area of skin thickened and slightly mounded, with faint redness	4-mm. mound-shaped swelling, faintly reddened
90965	Avian	Slight thickening of skin	Slight thickening of skin
	Mammalian	Slight thickening of skin	Slight thickening of skin

*Milk obtained from Health Department, Burlington, Vt.

Mist acid-fast bacillus: Avian tuberculin caused a slight thickening of the skin in most of the guinea pigs; mammalian tuberculin produced atypical reactions in four and a thickening of the skin in one. (Table V.)

Grass acid-fast bacillus: Every guinea pig in this group exhibited a deviation from the normal toward both avian and mammalian tuberculins and the sensitization to each was practically the same; two of the guinea pigs showed atypical reactions to both tuberculins and in the others there was slight mounding and thickening of the skin. (Table VI.)

Friedman turtle acid-fast bacillus: There was very little sensitization exhibited other than a slight thickening of the skin with a tendency toward mounding which seemed slightly greater on the side in which the mammalian tuberculin was injected. (Table VII.)

TABLE VI—*Grass acid-fast bacillus. Reactions to intracutaneous injections of avian and mammalian tuberculins. Each guinea pig received an intra-abdominal injection of 5 mg., moist weight, of a pure culture of the grass bacillus, 44 days prior to intracutaneous tests*

GUINEA PIG	TUBERCULIN	REACTION	
		24TH HOUR	48TH HOUR
90970	Avian	16 mm. area slightly raised and slightly reddened with 5 mm. central pale area	Area 5 mm. in diam., slightly raised and inflamed
	Mammalian	4 mm. area of skin thickened, with small pale center	4-mm. sharply circumscribed area, slightly raised and slightly inflamed
90972	Avian	Skin thickened over an area 1 cm. in diam., slightly raised and pale	Resolved to a pale mound, 6 mm. in diam.
	Mammalian	Trace of redness; skin very slightly thickened	3-mm. focus, reddened and raised with pinpoint necrotic center
90975	Avian	Skin thickened. No rubor	Pale thickening of skin
	Mammalian	Trace of rubor and slight thickening of skin	3-mm. mound, slightly reddened
90980	Avian	1-cm. area of skin thickened, pale	Pale thickening of skin
	Mammalian	Skin slightly thickened; brownish hue	3-mm mound, slightly inflamed

Acid-fast bacillus from nasal secretion: Sensitization to avian tuberculin was manifested in only one guinea pig by a small atypical reaction; this same guinea pig, however, gave a positive reaction to mammalian tuberculin; one other showed an atypical reaction and the other three only a slight thickening of the skin. (Table VIII.)

Smegma acid-fast bacillus: The sensitization was practically identical with that obtained in the nasal-secretion group. But one guinea pig exhibited sensitization toward avian tuberculin and that was in an animal which showed a fairly well-marked reaction to mammalian tuberculin. In the remaining four animals mammalian tuberculin produced a thickening of the skin with tendency toward blanching. (Table IX.)

DISCUSSION AND CONCLUSIONS

With the dose of inoculum used, none of the guinea pigs in any of the groups exhibited a systemic reaction to either the avian

TABLE VII—Friedman turtle acid-fast bacillus. Reactions to intracutaneous injections of avian and mammalian tuberculins. Each guinea pig received an intra-abdominal injection of 5 mg., moist weight, of a pure culture of the Friedman turtle bacillus, 45 days prior to intracutaneous tests

GUINEA PIG	TUBERCULIN	REACTION	
		24TH HOUR	48TH HOUR
90981	Avian	8-mm. area skin thickened, with trace of rubor	4-mm. brownish thickening of skin
	Mammalian	8-mm. area skin thickened, with small, pale center	Same appearance as on preceding day
90982	Avian	Slight thickening of skin	4-mm. area of skin thickened and brownish colored
	Mammalian	Slight thickening of skin	Slight thickening of skin
90984	Avian	Slight thickening of skin	Practically normal
	Mammalian	Slight thickening of skin	5-mm. area of skin slightly thickened and slightly reddened
90985	Avian	None	None
	Mammalian	Skin slightly thickened	3-mm. node, slightly reddened
90990	Avian	Slight thickening of skin	Slight thickening of skin
	Mammalian	Slight thickening of skin	4-mm. reddened node, with trace of necrosis

or mammalian tuberculin, while with but very few exceptions the skin was sensitized to both tuberculins.

The skin was sensitized more frequently to mammalian than avian tuberculin. In seven groups a greater sensitization was shown for mammalian tuberculin; in one group the sensitization appeared greater to avian tuberculin, and in the other group the sensitization was practically the same to both.

The degree of sensitization produced by the different types varied from practically zero in the case of the fish and turtle-bacilli groups to a fairly well-marked sensitization in the group inoculated with the acid-fast from hog skin.

An individual variability was also manifested in guinea pigs of the same group; some animals showed fairly well-marked sensitization while others showed practically none.

TABLE VIII—*Acid-fast bacillus from nasal secretion. Reactions to intracutaneous injections of avian and mammalian tuberculins. Each guinea pig received an intra-abdominal injection of a 5 mg., moist weight, of a pure culture of the nasal-secretion bacillus, 46 days prior to intracutaneous tests*

GUINEA PIG	TUBERCULIN	REACTION	
		24TH HOUR	48TH HOUR
90943	Avian	Skin slightly thickened	Resolved
	Mammalian	Skin slightly thickened	8-mm. area of skin slightly mounded, with trace of inflammation
90944	Avian	Skin slightly thickened	Skin slightly thickened
	Mammalian	Skin slightly thickened	Skin slightly mounded, with trace of rubor
90945	Avian	Slight thickening of skin	Skin slightly mounded
	Mammalian	Skin slightly thickened	Skin slightly mounded, with trace of rubor
90950	Avian	None	None
	Mammalian	Skin slightly thickened	Skin slightly thickened; turning brown
90955	Avian	Skin slightly thickened	6 - mm. area of skin mounded, with trace of reddening
	Mammalian	Skin thickened and inflamed over an area 15 mm. in diam.	Positive reaction; 13 mm in diam.; raised swelling with central area of necrosis, surrounded by zone of inflammation

TABLE IX—*Smegma acid-fast bacillus*. Reactions to intracutaneous injections of avian and mammalian tuberculins. Each guinea pig received an intra-abdominal injection of 5 mg., moist weight, of a pure culture of the *smegma bacillus*, 47 days prior to intracutaneous tests

GUINEA PIG	TUBERCULIN	REACTION	
		24TH HOUR	48TH HOUR
91003	Avian	None	None
	Mammalian	Skin slightly thickened	Skin mounded over an area 7 mm. in diam.
91008	Avian	None	None
	Mammalian	Skin blanched over an area 15 mm. in diam.	Resolved
91009	Avian	None	None
	Mammalian	Skin slightly thickened	Skin slightly thickened
91011	Avian	None	None
	Mammalian	Skin slightly thickened	1-cm. area of skin blanched, with small congested center
91012	Avian	Skin slightly thickened	5-mm. mound, slightly congested
	Mammalian	Skin raised, with trace of inflammation	Raised swelling, 1 cm. in diam., inflamed, with small necrotic center

The reactions as a whole were inconstant and decidedly atypical, but in a few instances reactions were obtained which could be differentiated from specific tuberculin reactions only by their size and their tendency toward earlier resolution.

ACKNOWLEDGMENT

Thanks are hereby expressed to Dr. William Charles White, of the Hygienic Laboratory, and Dr. H. J. Washburn, of the Bureau of Animal Industry, for their kindness in supplying cultures of the organisms used in these experiments.

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In the Heart of the Blue Grass
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CAUSES OF DEATH IN POULTRY FLOCKS*

By SIVERT ERIKSEN, *Pathologist*,†

*Missouri State Poultry Experiment Station
Mountain Grove, Mo.*

Discussions on poultry diseases are confined ordinarily to such common infections as roup, chicken pox, cholera, fowl typhoid, etc., and one is apt to form the opinion that if these diseases were conquered, deaths in poultry flocks could be kept under complete control. The feeling that the common infectious diseases are responsible for practically all losses is so firmly implanted in the poultryman's mind that when one visits a farm and a dead bird or two are found somewhere about the premises, the owner will invariably inquire if the bird did not die of cholera.

While it is true that the common infectious diseases mentioned cause a great deal of trouble and are the ones to be constantly on the lookout for, nevertheless, it is of interest, both from a statistical and a differential diagnosis standpoint, to find out from what causes fowls die during the course of a year. Statistics kept by the various egg-laying contests show that, during a year's time, from 9 to 18 per cent of the birds put in the contests die.

The causes of death in flocks where an autopsy is made on each dead fowl, for the purpose of a complete diagnosis, should be of interest and give some valuable information as to the actual common causes of deaths among mature, producing hens.

THE SOURCE OF INFORMATION

The information on which this paper is based is gathered from three years of close observation of the National Egg-Laying Contest, at Mountain Grove, Mo. This contest consists of sixty pens of six hens each, which, together with birds sent in to replace those dead, make a total of approximately 400 birds handled each year. The pens consist of entries sent by poultrymen from various parts of the United States and England. As soon as illness developed, each bird was removed from the pen and isolated in the hospital for individual care and attention. A careful autopsy was made of all dead birds and, when necessary,

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†Resigned, March 15, 1926.

TABLE I—Causes of death observed in three consecutive years of the National Egg-Laying Contest and two years of the State Pullet Test, at Mountain Grove, Mo.

	12TH NAT. CONT.	13TH NAT. CONT.	14TH NAT. CONT.	1ST PULLET TEST	2ND PULLET TEST	TOTAL
1. Abscess, abdominal	0	0	0	0	1	1
2. Accidental death	0	0	1	2	0	3
3. Blindness	2	0	1	0	0	3
4. Bronchitis	1	0	0	0	3	4
5. Chicken pox	1	1	0	1	0	3
6. Cholera	0	0	0	1	0	1
7. Crop bound	0	1	0	3	0	4
8. Concretions of oviduct	3	2	1	1	4	11
9. Cysts, cerebral	0	0	1	0	0	1
10. Diarrhea, bacillary	1	2	0	0	0	3
11. Diphtheria	0	4	0	25	8	37
12. Edema of lungs	0	0	0	0	1	1
13. Egg bound	0	1	0	0	0	1
14. Egg broken	0	0	0	0	1	1
15. Emaciation	3	0	2	0	0	5
16. Enteritis	1	0	1	1	2	5
17. Enterohepatitis	0	1	0	0	0	1
18. Fractures	0	0	1	0	0	1
19. Gout, visceral	1	0	2	1	3	7
20. Heat stroke	0	1	0	0	1	2
21. Heart failure	0	0	0	2	0	2
22. Hemorrhage, comb	0	1	0	2	0	3
23. Hemorrhage, foot	0	0	0	1	0	1
24. Hemorrhage, liver	2	5	4	2	8	21
25. Hemorrhage, lungs	0	0	0	1	1	2
26. Hepatitis	2	3	3	6	3	17
27. Inflammation, air sacs	0	0	0	0	3	3
28. Impaction, intestinal	1	1	1	1	1	5
29. Impaction of gizzard	0	0	1	0	0	1
30. Injury	0	0	2	0	0	2
31. Leukemia	3	1	1	1	4	10
32. Meningitis	0	0	1	0	1	2
33. Necrosis, gizzard	0	0	1	0	0	1
34. Necrosis, yolks	0	0	0	0	1	1
35. Nephritis	2	1	2	2	10	17
36. Otitis	0	0	0	0	1	1
37. Paralysis	4	2	2	8	3	19
38. Paralysis of crop and gizzard	0	0	1	0	0	1
39. Parasitism	0	3	3	3	0	9
40. Pericarditis	1	0	1	0	2	4
41. Peritonitis	1	2	4	13	3	23
42. Pneumonia	2	1	1	3	2	9
43. Prolapse of cloaca	0	1	1	1	2	5
44. Proventriculitis	1	0	0	0	2	3
45. Roup (all classes)	0	1	1	18	8	28
46. Rupture, cloaca	0	0	1	0	0	1
47. Rupture, intestine	0	0	0	0	1	1
48. Rupture, abdomen	0	0	0	0	1	1
49. Rupture, liver	3	4	1	2	0	10
50. Rupture, oviduct	0	0	1	0	2	3
51. Rupture, gizzard	0	0	1	0	0	1
52. Rupture, yolks	10	11	4	23	10	58
53. Tumors, general	9*	3	2	9	2	25
54. Tumors, ovary		3	1	3	2	9
55. Tumors, intestines		1	2	0	1	4
56. Tumors, liver		2	2	0	1	5
57. Tumors, heart		1	0	1	0	2
58. Tumors, comb		1	0	0	0	1
59. Tumors, eyelid		2	0	0	0	2
60. Tumors, wattles		0	1	0	0	1
61. Tumors, endothelial		0	2	0	0	2
62. Tumors, kidney	0	0	0	0	1	1
63. Ulcers of gizzard	0	0	3	1	0	4
64. Undiagnosed	0	0	2	1	0	3
65. Ventriculitis	0	0	0	0	1	1
66. Wryneck	0	1	0	2	1	4
67. Worms, gizzard	1	0	11	0	8	20
68. Worms, capillaria	0	0	0	1	0	1
Total Deaths	55	65	73	142	110	445
Total Birds Observed	402	400	396	693	633	2524
Per Cent Mortality (Average)	13.4	16.2	18.4	20.5	17.3	17

*Tumors not classified in this contest.

bacteriologic examinations were made before a final diagnosis was recorded.

Information was also obtained from the State Pullet Test, which consists of entries of ten birds each, received from Missouri breeders only. The birds are housed in flocks of 40 to 250 hens to each house. Sick and dead birds were handled in a manner identical with that previously described.

CAUSES OF DEATH

Table I gives causes of death in detail for three years' observation on the National Egg-Laying Contest and two years' observation on the State Pullet Test.

A glance at the table shows two very interesting things: the large number of different causes of death and the lack of any one or more specific causes. This is particularly significant, since the birds in these contests were taken care of in the very best manner possible. The feed was always the same and was given regularly throughout the year.

The absence of any outbreak of infectious disease is also to be noted. Such common conditions as chicken pox and roup, while clinically present, were very small factors in the actual death-rate. These conditions can apparently be handled in a satisfactory manner. Of other common infections, cholera was encountered only once, while tuberculosis was not found.

ORGANS AFFECTED

When one groups these disease according to organs affected, the following results are obtained:

Diseases of the respiratory tract 84	(18.8%)
Diseases of the intestinal tract 29	(6.5%)
Diseases affecting the nervous system 27	(6%)
Diseases affecting the egg-laying organs 81	(18.2%)
Diseases caused by intestinal parasites 30	(6.7%)
Diseases affecting the liver 59	(13.2%)
Tumors 52	(11.6%)
Miscellaneous 83	(18.6%)
Total number of deaths	445
Total number of birds observed	2524

INCIDENCE OF DEATHS

A very interesting observation is that of incidence of deaths. In various pens handled in an identical manner, as to housing, yarding, feeding, watering and general care, there is a marked difference in mortality. Table II, from the 14th National Contest and the second State Pullet Test, is a typical illustration.

TABLE II—Incidence of deaths in different pens

DEATHS	NUMBER OF PENS	
	14TH NAT. E.-L. CONT. (STARTING WITH 6 HENS PER PEN)	2ND PULLET CONTEST (10 BIRDS PER PEN THROUGHOUT THE YEAR)
1	23	15
2	22	14
2	5	16
3	4	11
4	3	2
5	2	2
6	0	1
7	1	1
Total Pens Observed	60	62

In the 14th National Egg-Laying Contest, twenty-three pens finished their year of production with the same six birds with which they started. Twenty-two pens lost only one bird each. A considerable drop occurs in the number of pens having greater losses. Only five pens lost two birds each, three pens lost four each, and two lost five each. In both of these cases only seven birds were entered, leaving only two birds in each of these pens at the close of the contest. The causes of death in these two pens were as follows:

Pen A: Meningitis, 1; gizzard worms, 1; visceral gout, 1; ulcers of gizzard, 2.

Pen B: Peritonitis, 1; gizzard worms, 1; ruptured yolk, 1; accidental death, 1; impaction of gizzard, 1;

One pen lost seven birds by death; five birds were sent to replace those dead, making a total of eleven birds entered. The causes of death in this pen were as follows: endothelial tumors, 1; gizzard worms, 3; visceral gout, 1; paralysis, 1; peritonitis, 1. In all three of these pens no predominating cause existed, although gizzard worms took the heaviest toll.

In the Pullet Test the results are very similar, although the proportions are slightly different, since each entry consisted of ten birds, with practically no replacements. In the pen having six deaths the causes were as follows: gizzard worms, 2; inflammation of air sacs, 1; intestinal obstruction, 1; tumor of kidneys, 1; necrotic yolk, 1.

In the pen having seven deaths the causes were as follows: paralysis, 2; edema of lungs, 1; gizzard worms, 1; concretion of the oviduct, 1; rupture of intestines, 1; proventriculitis, 1. In

this pen one replacement bird was allowed, making a total of eleven entered instead of the usual ten.

The records for all five pens having the highest mortality show no preponderance of any one specific condition and most of the causes must be classed as non-preventable.

The most logical explanation seems to be that these birds lacked resistance, either inherited or acquired early in life, against the various lethal factors to which all the birds were exposed.

There is evidently something besides care and environment which governs normal death-rate. Longevity is considered an inherited factor and the data presented here tend to support this view.

These observations bring out clearly the fact that mortality from miscellaneous causes, which may be considered non-preventable, is quite high in heavy-producing fowls.

MORTALITY OF THE VARIOUS BREEDS

During the course of years little difference is noted in the death-rate between the various breeds of poultry. In this respect longevity corresponds to egg-production. In either case there is a greater variation among different strains than among different breeds.

It is generally considered that birds of the light breeds, such as Leghorns and Anconas, are more susceptible to disease than are birds of the heavy breeds, such as Rocks, Reds or Langshans.

Figures for the last seven years, showing the mortality in the light and heavy breeds in the contest, are given in table III.

TABLE III—*Mortality in light and heavy breeds*

CONTEST YEAR	LIGHT BREEDS		HEAVY BREEDS		MORTALITY FOR ENTIRE CONTEST %
	BIRDS OBSERVED	MORTALITY %	BIRDS OBSERVED	MORTALITY %	
8	132	9.8	265	13.9	12.6
9	150	14.6	250	11.6	12.8
10	158	8.6	235	10.5	9.9
11	130	11.7	257	9.4	10.1
12	196	9.6	206	17.2	13.6
13	201	14.5	199	12.5	16.2
14	192	17.7	204	19.1	18.4
Total Average	1159	13.1	1616	13.6	13.3

From table III one obtains the surprising information that mortality of the light and heavy breeds alternated each year, and that the final mortality for a period of seven years was practically the same; viz., from a total of 1159 birds of the light breeds, 13.1 per cent died and from a total of 1616 birds of the heavy breeds 13.6 per cent died, a total average for all breeds of 13.3 per cent. Contrary to general opinion, the mortality was slightly higher (one-half per cent) in the heavy breeds.

THE FACTOR OF ENVIRONMENT

In the National Egg-Laying Contest, where the birds are housed in flocks of twelve to each house, with a partition in the middle of each house and six birds on each side, the infectious diseases such as chicken pox, roup, cholera, etc., are conspicuous by their extreme rarity.

In the State Pullet Test, where birds are housed in larger flocks, these diseases were much more prevalent. Especially was this true in the first State Pullet Test, where the birds were more crowded than in the second year. Deaths from the common infectious diseases were as follows: various forms of roup, 18; avian diphtheria, 25; cholera, 1. A number of cases classed as peritonitis were due to the cholera organism. It was also observed that the greatest number of deaths occurred in one particular house. This house was built on lower ground and had more shade than the others.

An important reason for higher mortality in larger flocks and crowded quarters is that personal attention to sick individuals cannot be given as promptly in the large flock as when the birds are divided into small flocks. In small flocks sick birds are noticed when symptoms first appear. When prompt individual attention is given, these birds readily respond to treatment. In large flocks the early symptoms are not noticed and when treatment is finally administered it proves to be too late in a large number of cases.

SUMMARY

1. Losses in poultry flocks in which the birds come from a large number of sources have a yearly mortality of from 9.9 to 18.4 per cent during their first productive year. The seven-year average for 2775 birds is 13.3 per cent.
2. Deaths are listed under 68 separate causes or conditions.
3. The incidence of mortality varies greatly with the different

pens or entries kept under identical conditions. This tends to support the theory that longevity is inherited.

4. Heavy breeds had 0.5 per cent higher mortality from a seven-year average than did the light breeds.

5. Large flocks are liable to have higher mortality than small flocks, not only because the spread of infection is greater, but also because it is more difficult to find and treat the sick birds early.

BUREAU TRANSFERS

Dr. Wm. O. Ney (K.C.V.C. '07), from Wheeling, W. Va., to New Orleans, La., on meat inspection.

Dr. W. P. Divelbiss (K.C.V.C. '12), from Lincoln, Nebr., to Omaha, Nebr., on meat inspection.

Dr. S. H. Moore (K.C.V.C. '08), from Fort Worth, Texas, to Albuquerque, N. Mex., on tuberculosis eradication.

Dr. Geo. C. Newberg (K.C.V.C. '06), from St. Louis, Mo., to Kansas City, Kans., on meat inspection.

Dr. Z. C. Boyd (K.C.V.C. '07), from Baton Rouge, La., to Little Rock, Ark., on tick eradication.

Dr. S. V. Ewers (K.C.V.C. '09), from Moscow, Idaho, to Yakima, Wash., in charge meat inspection.

Dr. A. S. Martin (K.C.V.C. '17), from Seattle, Wash., to Moscow, Idaho, in charge meat inspection.

Dr. Howard L. Box (O.S.U. '15), from Milwaukee, Wis., to Toledo, Ohio, on meat inspection.

Dr. J. C. Barney (U.P. '20), from Washington, N. C., to Jackson, Miss., on tick eradication.

Dr. H. Robbins (K.C.V.C. '06), from Washington, N. C., to Jackson, Miss., in charge tick eradication.

Dr. P. H. Hartman (U.P. '22), from Worcester, Mass., to New York, N. Y. on meat inspection.

Dr. Grover C. Pieper (Ind. '17), from St. Louis, Mo., to Cairo, Ill., in charge meat inspection.

Dr. Robt. N. Ashley (K.C.V.C. '08), from Reno, Nev., to Huron, S. D., on meat inspection.

Dr. G. W. Bromwell (K.C.V.C. '05), from Kansas City, Kans., to Denver, Colo., on meat inspection.

Dr. E. M. Berroth (K.S.A.C. '20), from Denver, Colo., to Kansas City, Kans., on meat inspection.

Dr. Harold J. Boyce (K.C.V.C. '17), from Pittsburgh, Pa., to Kansas City, Kans., on meat inspection.

Dr. I. W. Eichelberger (Ind. '12), from Los Angeles, Calif., to Cleveland, Ohio, on meat inspection.

Dr. Ralph V. Pilgrim (K.C.V.C. '15), from Oklahoma City, Okla., to Little Rock, Ark., on tick eradication.

Dr. Leo V. Hardy (St. Jos. '20), from Olympia, Wash., to Boise, Idaho, on tuberculosis eradication.

Dr. Emil Krenek (K.C.V.C. '16), from Fort Worth, Texas, to Phoenix, Ariz., on meat inspection.

Dr. H. L. Armstrong (O.S.U. '15), from Charleston, W. Va., to Baltimore, Md., on tuberculosis eradication.

FRIGHTS DISEASE OR PSEUDO-EPILEPSY*

By O. V. BRUMLEY, *Columbus, Ohio,*

College of Veterinary Medicine, Ohio State University

Your secretary has requested me to make a few statements in regard to the causative factor of frights disease or pseudo-epilepsy. Before going into the subject of the etiology of this disease it might be well to consider in a brief way some of the facts regarding its recent history and development in this country. Ten or twelve years ago, it was my privilege to be in rather close contact with a number of the veterinarians in the southern part of the United States, when this disease was called to my attention a number of times by them, from different sections of that part of the country. As far as I can determine, this disease was more or less localized or confined to the southern states, up to a period of approximately five or six years ago. At this time it seemed to be introduced to the dogs in the North and then spread rapidly throughout the entire country.

During the period prior to its introduction into the northern states, we attempted to make an investigation relative to the possible cause of it and considered many of the various agencies from which it might be possible for it to emanate. At that time we were of the opinion that it might be produced by distemper infection, in which the nervous system or a portion of it, at least, was primarily involved and produced the nervous phenomena characteristic of the disease. However, upon investigation of this possible causative agent we found several things which were significant, in that this disease would attack all ages of animals and in many instances those animals which had a clear history of previously having had distemper. Taking all of these facts into consideration, and also the fact that this disease produces quite clear symptoms in each case, led us at that time to exclude the possibility of distemper infection producing this condition.

At the same time parasitism was looked upon by some veterinarians as the probable cause of the disease. It was suggested to me that hookworm infestation would produce the symptoms indicated in these cases. This proposition was taken up and considered from many angles. At the same time, in this part of the country, we had quite a number of cases of hookworm infes-

*Presented at the thirty-fifth annual meeting of the Missouri Veterinary Medical Association, St. Louis, May 18-19-20, 1926.

tation in our hospital and to my knowledge none of these animals showed any of the nervous symptoms described in these cases of frights disease. Experiment animals were used and infested with hookworms and the results were the same. We even had some young animals shipped from the South and these were infested with hookworms from the same district. They were observed for a period of three months without manifesting any of the symptoms. Further observations were made in connection with other parasites and we were unable to prove that parasitism was in any way directly connected with the production of frights disease. As a final statment to be made relative to this experimental work, we found animals affected with frights disease that were not infested with parasites. Furthermore, the removal of parasites from animals showing symptoms of the disease did not seem to have any particular effect in relieving the symptoms.

THE QUESTION OF DIET

During this same period, following this experimental work, the question of diet was considered very carefully. An investigation was started in regard to the diet fed to these animals showing the disease in these districts. Naturally the diet was found to be variable and seemed to be so variable at the time that it was not thought of very seriously as a causative factor. An attempt was made at that time to determine whether any particular foods had any marked effect upon the progress of the disease. This experiment was not satisfactory, as it had to be conducted under adverse conditions and therefore was not convincing. I am relating these incidents to show that at this period of ten to twelve years ago, this disease was recognized as a distinct menace in the South and there was some activity in trying to solve its probable cause.

Approximately five years ago, this disease was introduced to our immediate community and the first few cases left us considerably in doubt in regard to the diagnosis. It was not long, however, until there were a sufficient number of animals affected in this community to afford ample opportunity for making a careful clinical study of the disease, as well as autopsies and bacterial and other investigations. Our clinical experience at this time showed much the same conditions as our previous experience, in that it rather definitely excluded distemper and parasitism as probable causes. This gave us an opportunity to

to check things pretty carefully in regard to these two particular proposed causes and after about one year of experience the members of our clinical staff were unanimous in their opinion that these two conditions could be excluded from consideration as being causes of frights disease.

In the autumn of 1922 this disease assumed a distinct menace to small animal practitioners in this community, as there were such a large number of cases which were very difficult and unsatisfactory from the standpoint of treatment. During this period a rather extensive bacteriological investigation was started in an attempt to find a specific cause for the disease, but owing to the fact that the disease became so widespread in such a short time it was very difficult to obtain animals known to be free from exposure. We were unable to show, at this time, anything of value from a bacteriologic standpoint but owing to the fact that the animals seemed to develop the disease, in practically all cases, from five to six days after exposure, indicated the possibility of some specific agent producing it.

PROTEINS MAY PLAY SOME RÔLE

At about this time my attention was called to the possibility of the disease being produced by different protein compounds. We were unable definitely to establish any direct connection between these compounds and frights disease. However, I do not wish to eliminate this as a possibility in the production of this condition because, according to the experience of some of our prominent canine specialists, they have shown rather conclusively that diet has an important bearing upon the production of the disease. I might say that in our hospital we have always made it a practice to use a rather extensive variety of foods, depending mainly upon meat, both raw and cooked, milk, canned meat, cooked rice, mush and biscuits made by different companies, in order to maintain good health among our patients.

Before the outbreak in 1922 we were feeding practically the same diet, using the same brands of biscuits, fed in practically the same manner, without any disease making its appearance. During the past eighteen months this diet has been maintained much in the same way and insofar as we can determine, it has not produced any cases in our hospital resembling frights disease. We are not thoroughly convinced, therefore, that protein compounds are direct causes of the disease. There is one thing, however, which must always be borne in mind—that diet may

add materially in the production of the symptoms, provided other factors are present in the animals. I am a firm believer in a properly balanced ration for these animals and in having the ingredients changed frequently, so as to keep the digestive processes functioning normally. It would seem to me that it will be necessary to consider very carefully just how much diet has to do with the production of nervous phenomena of this sort.

Our laboratory experiences and clinical observation, after considering all of these other agencies, lead us to believe that this disease is produced by some specific agent yet unknown. Recently I have been very much interested in the results of one of the laboratories of one of our sister institutions in which the findings seem to indicate definitely a specific organism as the etiological factor of frights disease. Perhaps in the course of another year or so this whole matter will be cleared up from the standpoint of its etiology. In the meantime we should attack this problem with an open mind in regard to all of these possibilities and try to establish definitely the correct and specific agent producing the disease. It is our policy to continue to work along all of these lines until one of them is definitely found to reproduce the disease without any question. I might add, in conclusion, that in the vicinity of Columbus, Ohio, there are very few cases of this disease at this time.

ON THE WAY TO LEXINGTON



Farmers studying better feeding methods under direction of county agricultural agent.

AN EXPERIMENTAL STUDY OF THE MECHANISM OF REGURGITATION IN RUMINATION

By H. D. BERGMAN AND H. H. DUKES

*Department of Veterinary Physiology, Iowa State College,
Ames, Iowa*

Rumination in its true manifestations is met with only in that class of mammalia termed ruminants. This peculiar act involves all of those processes whereby food in the stomach is regurgitated, remasticated, reinsalivated and reswallowed. The domestic ruminants are the ox, sheep, goat and camel. Among the wild ruminants are the deer, buffalo, giraffe, llama and chamois. All ruminants possess a complex stomach which is to be regarded as a prerequisite of rumination rather than as the cause, for not all animals with complex stomachs ruminate (whale, hippopotamus, sloth, etc.).

In this paper, discussion will be limited to the mechanism of regurgitation. Other phases of rumination, particularly the course of the food upon redeglutition, will be dealt with in future papers.

Regurgitation or rejection is the act of returning food from the stomach to the mouth. This singular phenomenon, together with the other manifestations of rumination, has attracted the attention of men from the earliest times, but it is really surprising to know that only a few investigators have approached the subject in anything like a comprehensive experimental manner. Exact knowledge concerning the act has therefore been limited, but unfortunately so, for when it is recalled that the ox spends nearly one-third of its time ruminating (Bergman and Dukes¹) and that regurgitation is an essential part of rumination, it is apparent that a thorough understanding of this process would be of considerable value.

It is the purpose to review some of the notable work of the past on the mechanism of regurgitation and to present the results of experimental work on this subject conducted by the authors during the past several years.

HISTORICAL

Rumination was known to Moses, Aristotle and Galen. Colin states that Peyer, Duverney, Haller, Buffon, Camper,

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Girard and others treated rumination in a philosophical manner, but added nothing to our exact knowledge of the process.

Daubenton,² from postmortem examinations of sheep with the reticulum in various stages of contraction, concluded that the bolus for regurgitation is molded by the reticulum and forced into the cardiac end of the esophagus via the esophageal groove. He never saw the supposed apparatus actually at work and made the altogether too common mistake of drawing definite physiological conclusions from postmortem anatomical findings.

Flourens³ seems to have proved that in the sheep the reticulum is not the immediate bolus-forming organ, as a result of an operation in this animal in which he cut away the floor of the reticulum and sutured the resulting rim of the organ to the floor of the abdomen. The sheep ruminated successfully afterward. Flourens thought, however, as a result of several autopsies on sheep, that he had proof that there is a special organ for the formation of boluses and this function he ascribed to the esophageal groove together with the closed reticulo-omasal and cardiac orifices, the ingesta being presented to this bolus-forming machine, he held, by the contraction of the rumen and the reticulum. The view of Flourens that the esophageal groove plays an important part in regurgitation is still adhered to by some at the present time.

Colin,⁴ who agreed with Flourens on many points, was in violent disagreement with him regarding the explanation of the mechanism of bolus-formation. He held that the esophageal groove is not the organ for bolus-formation. This he effectually proved by suturing together the lips of the groove in two bulls, in the one case using three brass wire sutures and in the other four. Perfect apposition of the lips of the groove was obtained, and the animals so treated later ruminated long and well and, to all appearances, in a perfectly normal manner. Autopsies revealed that all of the sutures were intact. Sisson⁵ wrongly gives Flourens credit for this striking experiment.

Furthermore, as pointed out by Colin, nature has already performed this experiment for us in another manner, for the llama and camel have only one lip to the esophageal groove, yet they ruminate apparently in the usual manner. In another ox, Colin could not succeed in getting the lips of the groove to seize boluses presented to them by hand.

He called attention to the great water-content of the mass of food to be regurgitated and was the first to state that there

is no bolus-formation properly so-called, previous workers having been obsessed with the idea of a mechanism for the formation of definite boluses. His theory of regurgitation, briefly stated, is that the ingesta are simply pushed into the infundibulum of the esophagus by the combined contraction of the rumen and reticulum, assisted by the fixed diaphragm and by the contraction of the abdominal muscles.

Toussaint,⁶ working in Chauveau's laboratory in the veterinary school at Lyons, put to the test of experimental inquiry a theory of regurgitation often mentioned by Chauveau in his lectures. This theory is essentially as follows: At the moment of regurgitation the glottis is closed. Then there is a very energetic and abrupt contraction of the diaphragm, resulting in a marked rarefaction of the air in the lungs. This fall in the intrapulmonic and the intrathoracic pressure shows itself on the outside by an energetic rush of blood in the jugular veins, and must have the same action on the ingesta in the rumen near the esophagus, which substances, because of their almost liquid state, are, with reference to the thorax, in the same condition as the blood in the jugular veins. The ingesta are therefore aspirated into the open orifice of the esophagus and immediately a contraction of the right pillar of the diaphragm separates off the substances that have entered the esophagus. Then follows an antiperistaltic contraction of the esophagus, which carries the ingesta to the mouth. Toussaint, under the guidance of Chauveau, set out to prove or disprove this theory.

By the use of tambours and of kymographs registering and recording the movement and pressure of air in the nasal passages and trachea, the movement of food in the esophagus, the movements of the thorax and of the rumen, of the ox and sheep, he concluded that the theory of Chauveau is essentially correct, that is to say, that regurgitation in these animals is brought about by a special aspiratory act of the thorax with a closed glottis, and that at the moment of regurgitation the rumen is quiescent.

Toussaint's work was very thorough and epochal, for so far as the writers are able to learn, he was the first to apply the graphic method to the study of regurgitation and allied phenomena.

Toussaint's work was done over fifty years ago. His conclusions have not been generally taught in English-speaking countries. Paton and Orr,⁷ in the 1921 edition of their textbook, hold essentially to the theory of Colin. Smith,⁸ in the 1912 edition

of his textbook, teaches a similar view of regurgitation. Likewise this view was accepted by the writers prior to 1922. In the 1921 edition of F. Smith's textbook, the theory of Chauveau and the conclusions of Toussaint are brought before the general English-speaking veterinary profession apparently for the first time. The authors being long dissatisfied with Colin's time-honored explanation of the act of regurgitation and favorably impressed with Chauveau's theory and Toussaint's conclusions, as enunciated by Smith in 1921, undertook, more or less independently of the work of Toussaint, to test the theory and conclusions by the graphic method. The statement, "more or less independently of the work of Toussaint," is used advisedly, because for several months the only references to his work available were the general statements by Smith. During this time many methods of procedure original with the authors were developed, it being revealed later that these methods were in some cases similar to those of Toussaint. After locating Toussaint's original work, the authors' methods were in some cases markedly influenced by his. In other instances, procedure was quite independent of his work.

EXPERIMENTAL METHODS

Since regurgitation is an act too rapid to be analyzed by the unaided senses, all attempts in this direction by previous workers having resulted unsatisfactorily, it was determined, on the clew in the 1921 edition of F. Smith's textbook, to put Chauveau's theory to test, using the graphic method.

Accordingly, intrapulmonic pressure changes during and between the acts of regurgitation were registered on the smoked paper of the kymograph by the use of a bromoform manometer, or sometimes a recording tambour, connected with the interior of the trachea by means of a long, rubber tube attached to either a trachea-tube or a horse cecum-cannula inserted into the trachea of the ox in about the midregion of the neck. Intrapulmonary pressure variations were so recorded in six cows, in one of these cows on many occasions, in another on several occasions. This method, similar to one used by Toussaint, was developed independently of his work.

The movements of the thoracic walls were recorded in several cows by means of either a Harvard or a Lombard pneumograph and a recording tambour. This method was likewise developed independently of a similar method used by Toussaint.

The movements of boluses in the neck were recorded by using a cardiograph over the left jugular furrow, the cardiograph being connected with a recording tambour by means of rubber tubing. This is an adaptation of a similar method used by Toussaint. These records were taken from three cows, two of the cows furnishing records on a number of occasions.

Pressure changes in the rumen during and between the acts of regurgitation were recorded in two cows, in the one by a bromoform manometer connected by means of rubber tubing with a cannula inserted into the rumen through the left flank, in the other by means of a bromoform manometer connected by rubber tubing with the interior of the rumen through a fistula in the left flank, the fistula being partly closed by a disk of heavy rubber.

Rectal pressure changes in four ruminating and two or three non-ruminating cows were recorded by a tambour connected by means of a rubber tube to a slightly-inflated, rubber balloon inserted into the rectum. The two last-named methods were not used by Toussaint.

Movement of air in the nostril during rumination was recorded by means of a tambour connected through rubber tubing to a hook-shaped, glass tube, the curved end of which was inserted into the nostril, the straight part of the tube being fixed to the dorsum of the cow's nose by means of tape and collodion. Such records were taken from two cows on several occasions.

Movements of mastication in two cows were registered by use of a tambour connected with a pneumograph around the jaws of the animal and held in place by being tied to the halter. These last two methods were modifications of similar methods used by Toussaint.

Lastly, numerous direct observations were made on the mechanism of regurgitation in a cow with a permanent fistula into the rumen through the left flank. The cow was of an even temperament and after frequent handling was habituated to continue rumination while the hand of the examiner, or a lamp for inspection purposes, remained in the rumen. So far as can be learned, this is the first successful effort to examine the ruminating animal in this way. Colin attempted this but, as he plainly states, was never successful in having the animal continue rumination while his hand remained in the rumen. The authors met with failure in two cows where rumen fistulas were established, the animals failing to adjust themselves to the unusual

condition produced, either as to nutrition or experimental handling.

More recently a permanent rumen fistula was successfully established in a young calf. Frequently handling of this calf resulted finally in allowing of successful observations.

RESULTS

By registering intrapulmonic pressure during and between acts of regurgitation, it was shown that regurgitation is always accompanied by a decided fall in this pressure (about 140-180 mm. of bromoform, U.S.P., sp. gr., about 2.6). (Fig. 1, m.) When the mechanics of the thorax is recalled, it is easily seen that a fall in intrapulmonic pressure must necessitate a corresponding fall in the pressure in the thorax outside the lungs (intrathoracic pressure). The thoracic part of the esophagus is subjected to intrathoracic pressure and as the esophagus of the ox is distensible, a fall in intrathoracic pressure must result in a corresponding negativity of pressure on the interior of the esophagus, the pressure changes being readily transmitted through its thin walls. Finally, direct observations on the fistula cow referred to above confirm the results of the graphic method. That is to say, one was able to place the fingers of the hand in the region of the cardia during and between the acts of regurgitation and to feel the distinct suction in that region when the cow regurgitated. This was especially noticeable when the level of food in the rumen was below the cardia, the animal in such cases aspirating practically nothing but air, and this with a loud noise. Also, small boluses formed with the hand and presented to the cardia were actually aspirated out of the hand of the examiner when the animal regurgitated. Similar aspiratory effect was noted in the calf.

As evidence that this negative pressure produced in the esophagus could be sufficient to aspirate the ingesta from the rumen into the esophagus, a negativity of pressure, comparable to that transmitted to the esophagus from the thorax, was produced artificially in a glass cylinder 9 cm. in diameter. The cylinder was supported vertically and dipped into a vessel containing chopped alfalfa hay moistened to the ordinary condition of the content of the anterior portion of the rumen. Negative pressure of 80-100 mm. of bromoform, as shown by a manometer, was created and this was sufficient to cause readily a several-inch rise in the cylinder of the material. It should be recalled that



Fig. 1. Tracing showing movements of air in the nostril, movements of the mandible (mastications), movements of boluses in the neck (deglutitions), movements of the thoracic walls (respirations), rectal pressure changes and intratracheal pressure changes during and between regurgitations in a cow. The cow regurgitated at m and n. All writing-points were vertically placed. For description of tracing and methods, see text.

the ingesta in the rumen are not raised vertically to enter the esophagus but rather are moved forward, and upward at a very gentle angle.

It is interesting to note that occasionally a single aspiratory effort of the ruminating animal is apparently unsuccessful in drawing the proper amount of food from the rumen into the esophagus. This fruitless attempt is immediately followed by a second attempt, as several tracings show.

If regurgitation is essentially the result of a special aspiratory act of the thorax, then it follows that food in the rumen must be on or above the level of the cardia if a successful regurgitation is to be made. This explains in part why a certain fullness of the rumen is necessary for the act of regurgitation, and is probably one of the reasons why the ox prefers the lying position to the standing during rumination. In this position the animal can instinctively bring the rumen content into better relation with the cardia. The peculiar rolling and stretching movements occasionally made by the ruminating animal while lying are probably explained in the same way, i.e., they may be additional attempts to establish the proper relation between the food to be regurgitated and the cardia.

The following are results of 24-hour and 12-hour continuous observations on a Jersey and a Guernsey cow, respectively, to determine the relation of rumination to lying and standing. The Jersey cow was lying 63.3 per cent of the time, while 81.7 per cent of her ruminating-time was in this position. The Guernsey cow lay 59.5 per cent of the time, while 91 per cent of her ruminating-time was in this position. Thus it is seen that the cow greatly prefers the lying position for rumination.

The movements of the thoracic walls, as recorded by means of the pneumograph and tambour, indicate that at the moment of regurgitation the animal is making an inspiratory movement (fig. 1, i). Such is to be expected in view of the simultaneous fall in intrapulmonic pressure mentioned above.

A study of the movements of boluses in the neck indicates that the lowering of the intrapulmonary pressure is immediately followed by the appearance of a bolus in the cervical region of the esophagus on its way to the mouth (fig. 1, f). Examination of this figure also reveals that, soon after the bolus enters the mouth, there are two deglutitions (g & h). They represent the fluid expressed from the semiliquid mass of food as it enters the mouth. It cannot be too strongly urged that all evidence,

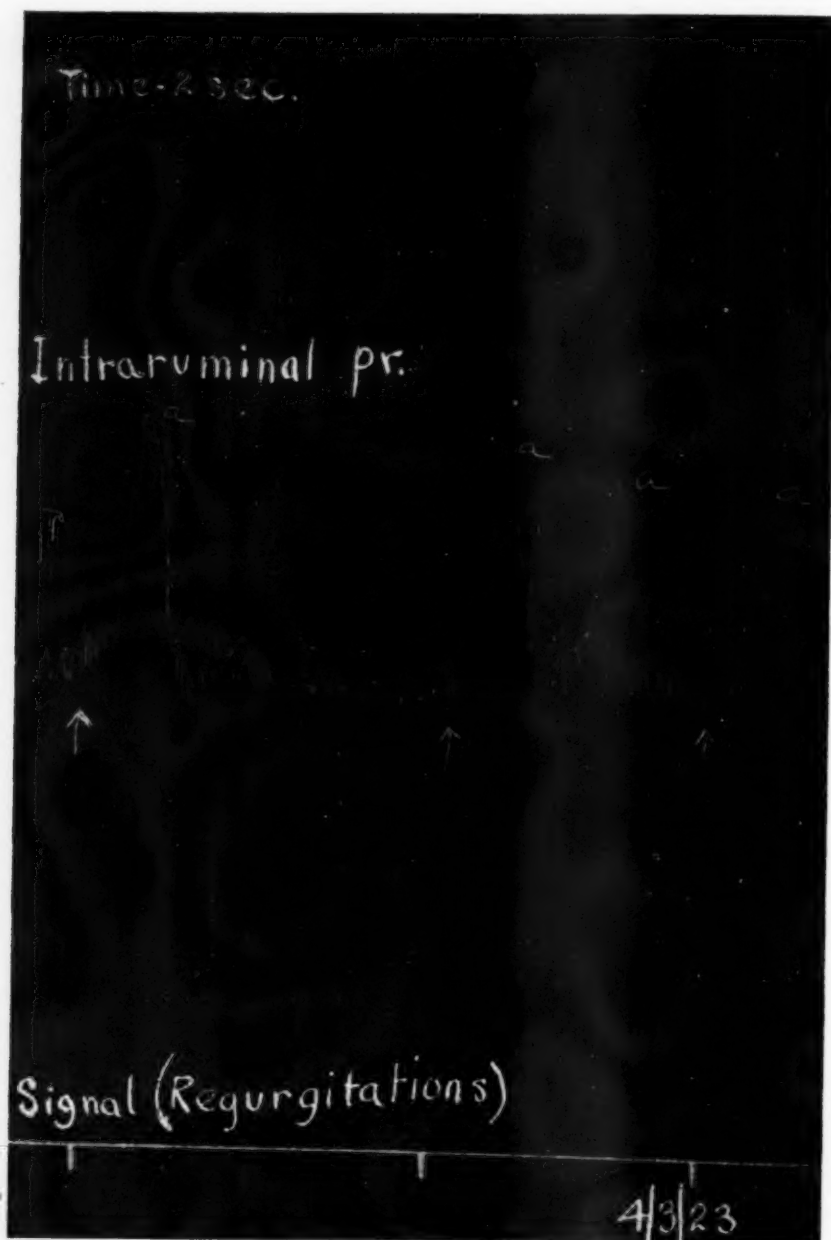


FIG. 2. Tracing showing intraruminal pressure changes during and between regurgitations in a cow. The arrows and the signals indicate the time of regurgitation. For description of tracing and method, see text.

direct and indirect, indicates that the mass of regurgitated food is highly saturated with fluid when it enters the esophagus.

In this connection it should be mentioned that in the fistula cow already referred to, there was an unavoidable loss of water through the fistula, especially when the cow lay down, all attempts to keep the fistula tightly closed having resulted in failure. This lack of water in the rumen was a distinct factor in inhibiting rumination, as is testified to by the fact that when water was added to the rumen through the fistula, the animal would often begin to ruminate.

A study of figure 2 is very interesting and instructive. It represents pressure changes in the rumen between and during the acts of regurgitation. It is plainly seen that intraruminal pressure is not elevated at the moment of regurgitation, but that an elevation (a) does come a few seconds afterwards. This rise in pressure is a result of a peristaltic contraction of the rumen and comes much too late to be of value in forcing the mass of food into the esophagus. In fact, the bolus of food is already in the mouth and is being masticated before the rumen has contracted. Even if the peristaltic contraction began simultaneously with the aspiratory act of the thorax, the former would reach its climax too late to be of value in the rapid act of regurgitation. In other words, there is no hesitancy in saying that the energy (negative pressure) for so rapid an act as regurgitation is produced by the contraction of skeletal muscle (diaphragm) and not by smooth muscle. This fact was also suggested by Toussaint. The view held by many that rumen contraction is of importance in forcing the bolus into the esophagus is, therefore, untenable for more than one reason.

Rectal pressure is not raised at the moment of regurgitation (fig. 1, k). This is strong evidence that the abdominal muscles are not contracting, for a rise in rectal pressure is regarded as an invariable accompaniment of contraction of the abdominal muscles when the glottis is closed. Furthermore, the pressure conditions in the thorax at the time of regurgitation are just the opposite of what they would be if the abdominal muscles were contracting. Also abdominal muscle contraction to be of aid in forcing the mass of food into the esophagus would have to be accompanied by some elevation of intraruminal pressure. This as explained above, does not occur. Therefore, the view often taught that the contraction of the abdominal muscles is of

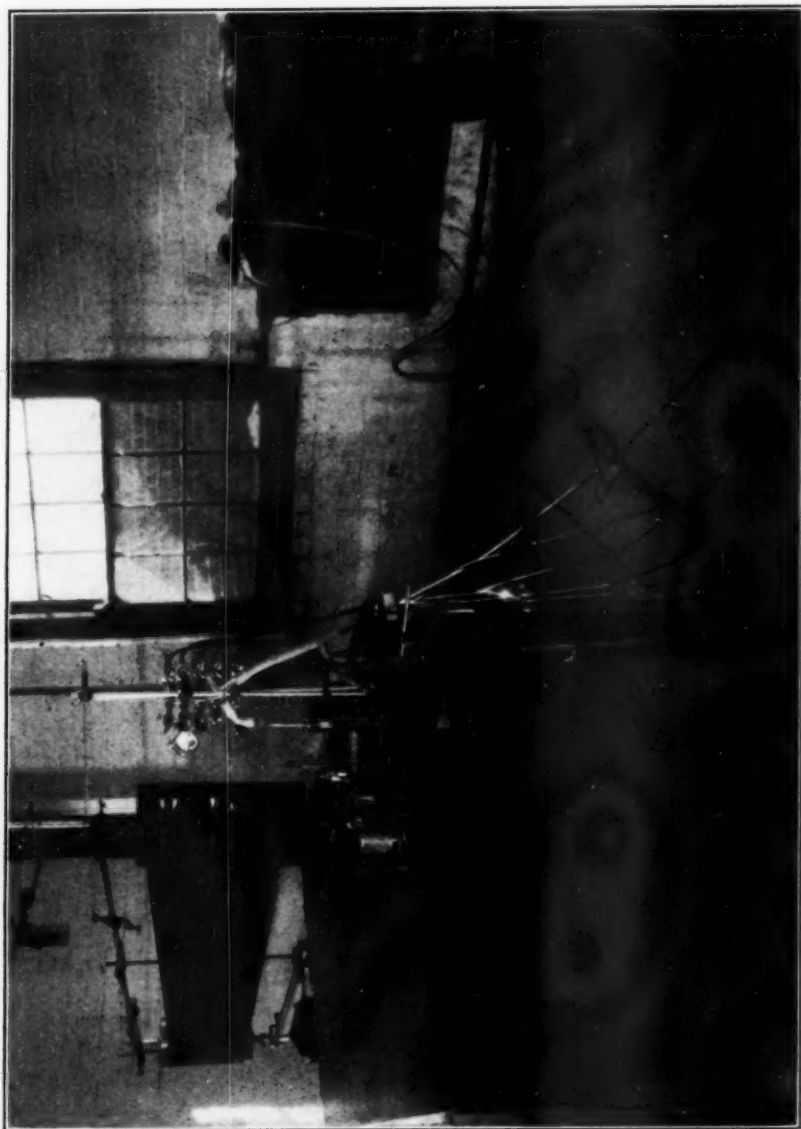


FIG. 3. Arrangement of apparatus and subject used in making tracing shown in fig. 1. The hemostats were clamped on the tubes to immobilize the writing-points while the photograph was being taken. For complete description, see text.

value in forcing the food into the esophagus is unjustifiable in the light of these findings.

Movements of the mandible can easily be studied in figure 1, together with their relation to the regurgitation (m), the redeglutition (e), the pause (cd) following redeglutition, etc. It should be noted that the animal is already masticating (d) the bolus when the expressed fluid is swallowed in two gulps (g,h). (According to Colin there may be three deglutitions of fluid.)

That the air-passages are blocked at the time of the lowering of the pressure in the lungs is clearly shown in figure 1 (ab), for while there is a marked descent of the writing-point registering intrapulmonic pressure, the writing-point tracing the movements of air in the nostril describes a horizontal line (ab). This means, of course, that the column of air in the respiratory passage is broken by a complete partition somewhere in the tract between the curved glass tube in the nostril and the cannula in the trachea of the animal. The blocking of the passage must be effected by the closure of the glottis.

Mention has already been made that palpations in the anterior part of the rumen of a cow and a calf during regurgitation confirmed the graphic findings that there is a distinct aspiratory action on the part of the thorax at the moment the mass of ingesta enters the esophagus. Also manual examination of the reticulum and of the esophageal groove at the moment of regurgitation appears to show them to be quiescent. The reticulum contracts just before and just after the aspiration of the ingesta into the esophagus, but apparently not during the aspiration. The same seems to be true of the esophageal groove. Holding together the lips of the groove during regurgitation did not interfere with the process, and Colin long ago showed, by suturing together the lips of the groove in two bulls, that they play no part in regurgitation, as already referred to.

SUMMARY

1. The need for a comprehensive study of the act of regurgitation is noted.
2. A review of the literature of the outstanding work on regurgitation is given.
3. There are presented methods and results of numerous graphic experiments, many of them original with the authors, on the mechanism of regurgitation. These experiments included registration of intrapulmonic, intraruminal and intrarectal

pressures during and between the acts of regurgitation; the demonstration of the closure of the glottis at the time of regurgitation; the movements of boluses in the neck of the animal; the position of the thorax at the time of regurgitation, etc.

4. Results of numerous supplementary observations on cows with experimental ruminal fistulas are also recorded.

CONCLUSIONS

1. In regurgitation in the ox, the entrance of food into the esophagus is effected by an aspiratory act of the thorax, the necessary negative pressure in the esophagus being produced by an inspiratory effort with a closed glottis.

2. There is no definite bolus-formation.

3. A fairly fluid condition of the food material in the anterior part of the rumen is necessary for successful regurgitations, the ingesta entering the esophagus well mixed with fluid.

4. The rumen and the abdominal muscles are not contracting at the moment of regurgitation.

5. The reticulum appears also to be quiescent at the instant of regurgitation, although it appears to contract just preceding and just after the aspiration.

6. The esophageal groove appears to take no active part in regurgitation.

ACKNOWLEDGMENT

The authors desire to acknowledge the cooperation of the Department of Veterinary Surgery in certain of the surgical procedures necessary in conducting these experiments.

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FARM POPULATION DECREASING

A continued decrease in farm population in the United States is reported by the U. S. Department of Agriculture, which estimates that there were 479,000 fewer people on farms January 1 this year than on January 1 a year ago. The department estimates the farm population at 30,655,000 on January 1, 1926, compared with 31,134,000 on January 1, 1925, a decrease of 1.5 per cent. These figures include all men, women, and children living on farms.

THE DIAGNOSIS OF INFECTIOUS ABORTION WITH SPECIAL REFERENCE TO AGGLUTINATING LIMITS

By FRANK P. MATHEWS

*Department of Veterinary Science
Purdue University Agricultural Experiment Station
Lafayette, Ind.*

INTRODUCTION

The complement-fixation and agglutination tests for infectious abortion are of definite value in the control of this disease, but have some well-recognized limitations. A positive reaction to either test does not indicate that an animal is infected at the time such a reaction is obtained; consequently, all positive reactors are considered to be equally dangerous to a herd. It is generally recognized that there are two distinct groups of reacting animals; first, those that remain constant carriers for an indefinite period and, second, the animals that soon overcome the infection and would eventually cease to react if the possibility of reinfection was prevented. The inadequacies of our present methods of diagnosis are due to our inability to identify the former and more important group. Although control measures based upon present diagnostic criteria have given good results, there are few people associated with the control of this disease who do not appreciate the need of a test or system of testing that will enable us to identify the group of reacting animals responsible for the spread of the infection. It was with this object in view that the present investigation was undertaken.

EXPERIMENTAL

In the fall of 1923, ten herds totalling 264 animals were obtained for the investigation. The complement-fixation and agglutination tests were conducted with sera collected from all of the animals at 60- to 90-day intervals, and bacteriological examinations were made from material collected at the time of calving or abortion. Due to the lack of cooperation on the part of the owners, five herds were dropped before the end of the first year. Two other herds proved to be free from *A. abortus* infection, and were also discontinued about the same time. These herds furnished data for the comparison of the two sero-

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logical tests, and for the isolation of *A. abortus*, but they are not considered in the data dealing with the curves established by agglutinating limits. These data were obtained from the three remaining herds, totalling 98 animals, and cover a period of a little over two years.

The agglutination tests were conducted with antigen prepared by growing three strains of *A. abortus* on pork-infusion-agar flats containing 1 per cent peptone, 0.5 per cent NaCl and 1.5 per cent agar having a pH of 7.4. The forty-eight-hour growth, incubated at 37° C., was washed off with physiological salt solution (phenolized 0.5 per cent), filtered through cotton, and standardized to a turbidity of 1.2 according to McFarland's nephelometer. Whenever a new lot of antigen was introduced into the experiment, it was prepared in the same manner and checked with at least two sera that had been tested with the preceding lot.

The amounts of serum required to make given dilutions were placed in test-tubes and 1 cc of antigen added to each tube. Dilutions of 1-25, 1-50 and 1-100 were used for all non-reactors and the titer of each serum was determined for all reactors. The dilutions used in the titrations are indicated in charts 1 and 2. A partial agglutination in a dilution of 1-50 was considered a positive reaction, since in previous work¹ it was shown that such a reaction is an indication of past or existent infection.

The complement-fixation tests were conducted according to the method of Park and Williams², with the following modifications: The same cultures of *A. abortus* were used for the production of antigen for this test as for the agglutination test. The antigen was diluted to a turbidity of 3 and heated in a sterilizer at 100° C. for 30 minutes. No preservative was added to it, and only freshly prepared antigen was used. All of the antigen showed uniformly good complement-binding properties, and practically no anti-complementary action. Three diagnostic tubes containing .04, .02 and .01 cc of each animal's serum were used. A complete fixation of complement with .04 cc of serum, and a partial fixation of complement with .02 cc were considered a positive reaction.

The material for bacteriological investigation was collected by local veterinarians, who had received special instructions, and mailed to the laboratory, an arrangement that proved very satisfactory. The material consisted of fetal cotyledons, which

were packed in borax, and uterine exudate, collected by swabbing the cervix and vaginal wall with a sterile swab.

Agar slants were inoculated with both swab and cotyledons, and incubated in glass jars that contained approximately 10 per cent CO₂. Pork-infusion agar, made from equal parts of lean pork and liver, was used for the slants; otherwise it was identical with the agar previously described. The swab and cotyledons were macerated separately in sterile salt solution and each macerate injected intraperitoneally into a guinea pig. The guinea pigs were killed, six to eight weeks later, their sera tested for *A. abortus* agglutinins, and the spleens and livers cultured for the same organism.

RESULTS

Agglutination and complement-fixation tests were conducted on 942 samples of serum and, of this number, 402 gave positive reactions with the agglutination, and 398 with the complement-fixation test. There was exact agreement in 98 per cent of the two tests, which percentage was a little lower than the total figures show. In the majority of tests that did not exactly agree, bacteriolytic antibodies were detected before agglutinins, and when an animal ceased to react the two antibodies disappeared in this order.

Table 1 summarizes the results of the experimental work with fetal membranes and uterine exudates collected at the time of parturition. An examination of the table shows that guinea pig inoculation demonstrated the presence of *A. abortus* with greater regularity than by direct isolation of the organism.

TABLE I—Isolation of *A. abortus*

REACTING ANIMALS				ABORTING, NON-REACTING ANIMALS			
GUINEA PIG INOCULATION		DIRECT ISOLATION		GUINEA PIG ISOLATION		DIRECT ISOLATION	
+	14	+	11				
—	30	—	62	—	15	—	15

+ = *A. abortus* isolated from fetal membranes or uterine exudate, or both

— = *A. abortus* not isolated

In the eleven cases in which *A. abortus* was demonstrated by direct isolation, it was also demonstrated by guinea pig inoculation. As the table indicates, 15 cows aborted that did not react to either test. *A. abortus* could not be isolated from these animals by either of the methods used. Twelve of the 15 abortions

occurred in a herd in which 21 similar abortions had occurred over a period of three years. Twelve feti were examined and a special effort made to isolate a specific organism. In addition to the direct method used for the isolation of *A. abortus*, anaerobic and sealed-tube methods were employed, using blood- and serum-agar. When contamination was eliminated, the media remained sterile. Traum and Hart³ report a similar outbreak of abortion.

By determining the agglutinating limits of sera from reacting cows at regular intervals for a long period of time, it was found that the reactions obtained were of two types and furnished a definite basis for the division of the reacting cows into two groups. In group 1 there were 20 cows in which the agglutinating limits either remained at constant high levels, or increased in subsequent tests. The elimination of *A. abortus* at the time of parturition was found to be confined to this group, which supports the results of Seddon.⁴ In group 2 the agglutinating limits for 27 cows were found to decrease gradually. Eight animals of this group have ceased to react since the investigation was undertaken. Typical curves representing the agglutinating limits of three cows from each group are given in charts 1 and 2.

The presence of *A. abortus* was demonstrated in the material collected at the time of parturition from ten cows of group 1, but this organism could not be demonstrated in similar material collected from sixteen cows of group 2. Some of the cows in each group failed to calve during the investigation, and the presence or absence of *A. abortus* in the material collected from the remainder of the animals in each group could not be determined on account of inadequacies in the two methods employed for the isolation of this organism.

DISCUSSION

Disagreement between the complement-fixation and agglutination tests was due to the order in which the two antibodies appeared or disappeared from the blood-serum of the animal. Bacteriolytic antibodies were detected before agglutinins, when an animal was tested soon after contracting the infection. However, as the infection was overcome and the animals gradually ceased to react, the former antibody disappeared about sixty days before the complete disappearance of the latter. Mohler and Traum⁵ and Moore and Fitch⁶ have reported the appearance of the two antibodies in the reverse order.

A summary of the first 500 tests shows the superiority of the complement-fixation test, but the final summary shows that the efficiency of both tests is practically the same. The initial advantage in favor of the complement-fixation test was the result of testing several animals soon after they contracted the infection, and was entirely overcome by subsequent tests conducted on animals just before recovery, as indicated by the complete disappearance of both antibodies. These results emphasize the importance of a large number of tests that include animals in all stages of the disease, when comparing the efficiency of the two serological tests.

The presence of rapidly-growing, contaminating organisms makes it difficult and sometimes impossible to detect the slow-growing colonies of *A. abortus*. Attempts to isolate the organism by guinea pig inoculation frequently resulted in failure, due to the presence of bacteria or toxins that were highly pathogenic. About 25 per cent of the guinea pigs inoculated with fetal membranes or uterine exudates from the cows in group 1 died within five days following inoculation. The fatalities following inoculation with material from the cows of group 2 amounted to about 5 per cent. In spite of the above difficulty this method proved more reliable than the direct method of isolation on culture media, as shown by table I. However, the recent work of Buck and Creech⁷ questions the extreme susceptibility of the guinea pig to *A. abortus* infection.

The value to be derived by determining the agglutinating limits of sera from infected cows, at regular intervals for a long period of time, is clearly demonstrated by the curves shown in charts 1 and 2. The outstanding feature shown by the curves for the cows in group 1 (chart 1) was constant, high agglutinating levels, interspersed with frequent increases which occurred during gestation, or soon after parturition. This type of curve is in marked contrast to that for the animals of group 2 (chart 2). It will be borne in mind that *A. abortus* was uniformly present in the uterine discharges from the animals of group 1; but it was not found in similar material from the animals of group 2. This is ample explanation for the two types of serological reactions.

The results obtained from cow 60 L (chart 1) are of particular interest. This animal aborted a few days before the investigation started. The chart shows she aborted in January, 1925, gave birth to a normal calf in 1926, and eliminated *A. abortus* at the latter date. She was evidently a constant carrier and was

no doubt eliminating *A. abortus* with the uterine exudate at the time she aborted in 1925. The negative results recorded on the curve for this animal were obtained from exudate collected three weeks after abortion, which was undoubtedly sufficient time for the disappearance of *A. abortus* from the uterus. Attempts to isolate *A. abortus* from the fetal membranes and exudate collected immediately after abortion were not successful, due to previously stated reasons.

Cows giving serological reactions similar to those of group 1 probably eliminate *A. abortus* with the milk, but this condition

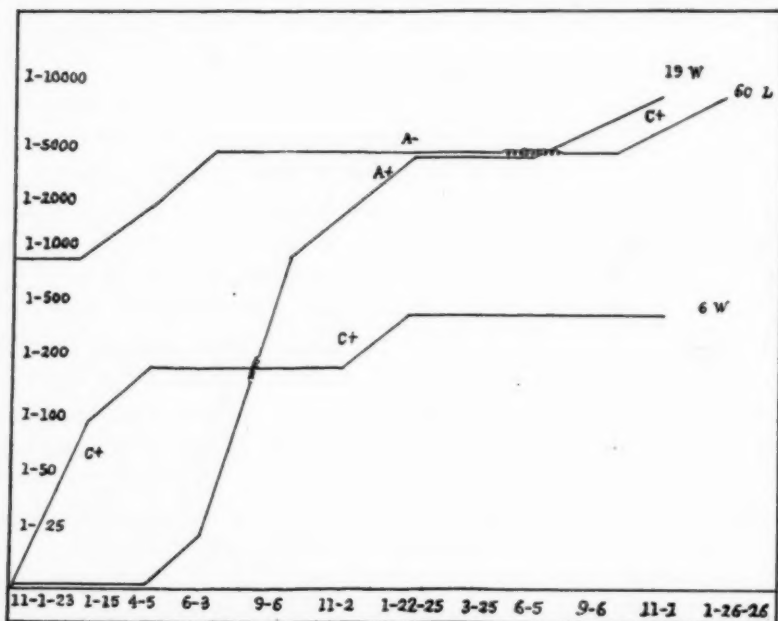


CHART 1. Curves representing the agglutinating limits of cows (group 1) infected with *A. abortus*. The dilutions are indicated on left and the dates of testing on the lower margins. C+, normal parturition and the isolation of *A. abortus* from uterine discharge at the time of parturition; A+, abortion and isolation of *A. abortus* at the time of abortion; A-, failure to isolate *A. abortus*.

was not determined in the present investigation, except for two cows of group 2. However, Schroeder and Cotton⁸ have noted that the elimination of *A. abortus* with the uterine discharge, following normal parturition, by reacting cows is associated with udder infection. Assuming this to be a constant condition it is probably evident that the animals in group 1 are the chief offenders in the dissemination of the infection and, therefore, of prime importance when considering control measures. The possibility of their recovery is indeed remote, and the slaughter of

animals giving serological reactions of the group-1 type would be advisable in most cases.

Curve 1W (chart 2) shows a rapid increase in agglutinating limits followed by a much slower decrease. The cows of group 2 that contracted the disease after the investigation was started show a similar increase. The rate at which the agglutinating limits decreased was constant for all animals in the group, and when a peak was established it was possible to draw some conclusions as to the time that would elapse before an animal would cease to react. The time required for the complete dis-

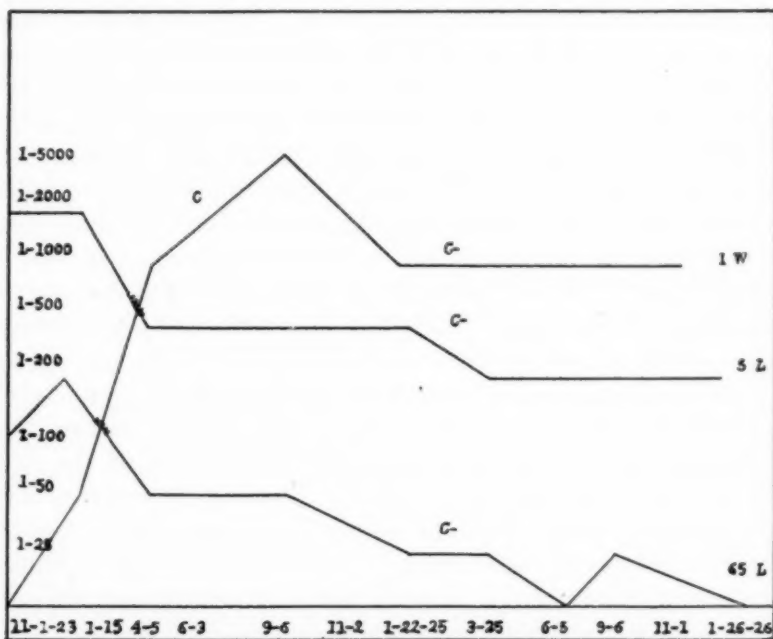


CHART 2. Curves representing the agglutinating limits of cows (group 2) apparently capable of overcoming *A. abortus* infection. Dilutions and dates of testing indicated as in chart

1. C—, normal parturition and *A. abortus* not isolated at the time of parturition:
C, normal parturition but no attempt made to isolate *A. abortus*.

appearance of antibodies appeared to depend to some extent on the amount of their production. It must be conceded that in so far as the serological tests were concerned, the complete and permanent disappearance of both antibodies was an indication that the animal was no longer infected. As eight animals of group 2 ceased to react since the investigation started, a constant decrease in agglutinating limits, such as shown by curve 65L, is evidently an indication that many animals are capable of complete recovery, providing they are not reinfected.

It would have been of interest to have known the exact date at which all animals of each group became infected, but this was impossible, as many were reactors at the time the investigation began. However, it was evident that a large percentage of the cows in group 1 became infected during the first gestation period, and that many of the cows in group 2 contracted the disease later in life. Considering the eight cows that have ceased to react, 60 per cent became infected after the second gestation period. Evidently, the age of greatest susceptibility, which is between ten months and three years, as noted by Rettger and White,⁹ plays an important part in the outcome of the infection.

Relatively high agglutinating limits, obtained with a single test for an individual, are of little value when considered alone, but when the relation to past and subsequent agglutinating limits is considered, some information as to recent or existent infection is obtained. For example, consider the agglutinating limits for cows 5L and 6W, which were found to be equal in January, 1925, and sufficiently high to be considered by some investigators as an indication of recent infection. It will be noticed that a second decrease in agglutinating limits for 5L was obtained in April, 1925, and that between January and April, 1925, *A. abortus* was not eliminated with the uterine discharge obtained at a normal parturition. In contrast to the reactions for 5L, curve 6W shows a higher agglutinating limit in January than at any previous test and as shown on the curve this cow was eliminating *A. abortus* between November, 1924, and January, 1925. This is one of the several cases developed in this investigation that failed to support the findings of Smillie, Little, and Florence¹⁰ and others, that a relatively high agglutinating limit is an indication of recent infection.

The colostrum of two cows of group 2 was examined in the same manner as the uterine exudates collected at the same time, and neither was found to contain *A. abortus*. No other studies of colostrum were made.

The relation of agglutinating limits to the act of abortion is of interest. In one herd, 78 per cent of the animals gave serological reactions of the group-1 type. This herd had a 46 per cent abortion-rate during the period of observation. In the other two herds, 23 per cent of the reactions were of group 1 type, and an 8 per cent abortion-rate occurred during the same period. No disease-control measures were practiced in the first herd, but in the other two herds all animals were isolated at

the time of parturition and until all uterine discharge ceased. Eight months after this practice was established, a noticeable decline in the agglutinating limits for several animals was noted.

SUMMARY

Nine hundred, forty-two samples of sera collected from 264 animals were tested with the agglutination and complement-fixation tests. The results show a negligible advantage in favor of the agglutination test.

A. abortus was isolated by guinea pig inoculation with greater regularity than by direct isolation. *A. abortus* was not isolated from animals that aborted but failed to react.

The causative factor in 21 cases of abortion, occurring in a pure-bred herd, could not be determined.

It was possible to divide the reacting animals into two groups, according to the curves established by the agglutinating limits of their sera. The curves for the animals of group 1 showed no appreciable decline over a long period. The curves for animals of group 2 showed a gradual decline, which began a few months after infection with *A. abortus*. Eight animals of this group ceased to react during the period of investigation. The elimination of *A. abortus* at the time of parturition was confined to group 1.

ACKNOWLEDGMENT

The writer is indebted to herd-owners who have placed their herds at the disposal of the Department, and to Dr. G. H. Roberts for the collecting of blood-samples.

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ASS-ISTANCE WANTED

It is reported that a veterinarian down in Owensboro, Ky., decided to branch out into the field of politics. During the campaign, which was rather warm, his political enemies referred to him with mingled sarcasm and scorn as the "Vet," and one day at a heated debate one of them asked, "Are you really a veterinary surgeon?"

"Why do you ask," queried the quick-witted politician. "Are you ill?"

THE EFFECT OF CASTRATION ON PIGS AT DIFFERENT AGES*

By B. L. WARWICK,† *Department of Veterinary Science*
and

E. E. VAN LONE, *Department of Genetics*
University of Wisconsin
Madison, Wisconsin

Three routine practices in the raising of pigs occur near the same time: (a) vaccinating, (b) castrating, and (c) weaning. Experience has shown that these can not be satisfactorily carried on simultaneously. To postpone vaccination increases the expense, increases the danger of infection before immunization, and increases the feed loss during the vaccination period. Until the exact minimum age at which permanent immunity may be produced with certainty is known, the hastening of the time of vaccination should not be overdone.

Limited experience had shown that castration of new-born pigs could be safely performed. It was thought that, if there were no serious objections to this method, one of the complicating factors near weaning time would be eliminated by castration at birth.

OBJECTS OF EXPERIMENT

This experiment is designed to show:

- (1) Whether castration at birth increases the mortality.
- (2) Whether castration at 4 to 5 weeks of age causes a check in growth.
- (3) Whether there is any significant difference in the rate of growth of (a) male pigs castrated at birth, (b) male pigs castrated at 4 to 5 weeks of age, and (c) female pigs of the same litters.

PREVIOUS INVESTIGATIONS

So far as we are able to determine, the comparison of the growth of castrated and normal males has never been put to experimental test with any farm animal, regardless of the age of the animal at castration, with the exception of poultry and

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†Now in the Department of Animal Industry, Ohio Agricultural Experiment Station, Wooster, Ohio.

Received for publication, May 25, 1926.

goats. Waite¹ reviewed the previous work with poultry and showed by his own experiments that the enormous increases in size, claimed by some for the capon over the cock, could not be substantiated. As a result of comparing the growth curves of 21 capons (caponized at 66 days of age) with 21 cockerels, he concludes that "there was practically no difference until the cockerels began to reach maturity, at which time the capons made slightly better gains." He also showed that the feed consumed was practically the same, giving the capons a slight advantage.

Observations reported by Fish² with four goats (two castrates, one normal and one female) indicate that castrates grow to only about half the size of normal males of the same age. Also, the horn growth is greatly retarded. These animals were castrated at 74 and 83 days of age respectively and his observations were continued over about 20 months.

Hobday³ reviews the work of Pirsche,⁴ P. E. and R. Launois,⁵ and Poncet⁶ with fowls, guinea pigs, and dogs respectively, and, while the number of animals in each case was small, arrives at the following conclusions: "In animals which have been castrated, there is (a) an increase in the length and weight of the bones. . . . (b) There is a delay in the obliteration of the epiphyseal cartilages."

The first systematic study of the growth of castrated and uncastrated mammals, under experimental conditions, is that reported by Stotsenburg.⁷ These trials were with rats and extended over two years, in three series. In each case the litters were divided, the patients were anesthetized, and the two testicles of each animal were removed through a single incision. The operations were performed at the fourteenth or fifteenth day after birth, which is about the age at which the testicle descends into the scrotum in the rat. After showing growth curves of castrates and normals, both of an entire series and of separate litters, he reached the following conclusions:

1. In albino rats, the growth curve is similar in castrates and normals.
2. Castrates are as susceptible to incidental influences on growth as normals.
3. Castrates are as susceptible to disease (and digestive disturbances) as normals.

His experiments include 99 animals, of which 52 were castrated and 47 were controls, so the results seem significant. The same author⁸ reports the growth of spayed rats in which the spayed individuals gained 30 per cent, 17.1 per cent, and 30.9 per cent

more, respectively, in three series than the control groups. In two of the series, the body length was also determined and an excess of 3.4 per cent was found in the spayed rats over the controls. This would call for 12 per cent increase in weight, with the balance of the increase to be represented by fat, which was verified by postmortem examination. These experiments include 38 operated and 35 controls from the same litters.

Hatia's^{9,10} detailed postmortem examinations of the rats used in the castration and spaying experiments of Stotsenburg show that the only significant differences between operated and unoperated rats, of the same sex in each case, are: (a) greater body-length in spayed females, (b) greater body-weight in spayed females, (c) larger hypophysis in castrates, (d) slightly greater tail-length in castrates. Also, in the case of semi-spaying, the only difference between operated and unoperated was an almost perfect compensatory growth of the remaining ovary.

Moore's¹¹ work with rats verifies the conclusions of Stotsenburg, that castration does not affect the rate of growth of male rats, and that spaying causes a marked increase in size of the growing female. The work of Shimamura and Matsuba¹² on rats

TABLE I—Average weekly weights in pounds

GROUP	TRIAL	TOTAL PIGS	AGE IN WEEKS							
		NUM- BER	BIRTH	1	2	3	4	5	6	7 ¹
I. Birth Castrates	1	13	2.9	4.4	6.6	8.0	9.2	10.5	12.6	14.6 ± .775
	2	17	2.8	4.8	7.5	8.7	10.6	12.3	14.5	18.1 ± .920
	3	25	2.7	4.9	7.6	10.3	13.2	17.3	20.9	26.9 ± .785
	All Trials		2.8	4.8	7.3	9.3	11.5	14.1	17.0	21.3 ± .688
II. Castrated at 4 to 5 weeks	1	18	2.9	4.9	7.0	9.1	10.6	12.4	14.6	17.0 ± .660
	2	22	2.8	4.7	7.1	8.3	9.9	11.5	13.8	17.5 ± .705
	3	21	2.8	4.9	7.3	9.7	13.0	16.8	20.9	26.2 ± .813
	All Trials		2.8	4.8	7.1	9.0	11.2	13.6	16.5	20.4 ± .584
III. Females	1	43	2.6	4.4	6.3	8.0	9.3	10.9	13.2	16.1 ± .582
	2	27	2.6	4.4	6.5	7.8	9.3	10.6	12.4	15.3 ± .570
	3	42	2.7	4.9	7.4	10.1	13.4	17.5	21.5	27.1 ± .598
	All Trials		2.6	4.6	6.8	8.7	10.8	13.3	16.1	20.0 ± .492

¹Includes probable errors.

also confirms the conclusions of Stotsenburg and of Moore as to growth of castrated males. In addition they make the interesting observation that in animals castrated before 60 days of age, the length and weight of the long bones is *less* than in the controls.

The effect of gonadectomy on guinea pigs was studied by Moore.¹³ He showed that gonadectomy was followed by a decrease in the growth-curves for both sexes. Among his conclusions are the following significant statements:

Total length of the animals corresponds to total weights in the order: normal males > normal females > spayed females > castrated males. Spaying is conducive to bone growth in operated females; the relative differences are considerably more pronounced than those following castration.

From the above review, it seems certain that the different species, as well as the different sexes of animals respond differently to the operative removal of the gonads. None of the experiments and observations have been carried on with swine, so are not directly applicable to our problem, but deal with the general situation.

PLAN OF THE EXPERIMENT

Three series of trials have been carried out. These include the spring farrowing season of 1923 and both spring and fall farrowing of 1924. Each available litter of pigs was examined within 24 to 36 hours of birth, and each pig marked, weighed, and its vigor noted. The males were then divided into two groups,

TABLE II—Mortality table (Summary of all three trials)

GROUP		AGE IN WEEKS							
		BIRTH	1	2	3	4	5	6	7
I. Birth castrates	Number alive	104	86	80	75	68	60	56	55
	Number dead		18	6	5	7	8	2	1
	% weekly mortality ¹		17.3	6.9	6.3	9.3	11.7	3.3	1.8
	% total mortality ²		17.3	23.1	27.9	34.6	42.3	46.2	47.1
II. 4 to 5 week castrates	Number alive	102	89	84	83	78	69	63	61
	Number dead		13	5	1	5	9	6	2
	% weekly mortality		12.7	5.6	1.2	6.0	11.5	8.7	3.2
	% total mortality		12.7	17.6	18.6	23.5	32.4	38.2	40.2
III. Females	Number alive	205	173	167	156	140	134	118	112
	Number dead		32	6	11	16	6	16	6
	% weekly mortality		15.6	3.5	6.6	10.3	4.3	11.9	5.1
	% total mortality		15.6	18.5	23.9	31.7	34.6	42.4	45.3

¹Represents the percentage of the number alive at beginning of the week which died during the week.

²Represents the percentage of the number alive at beginning of the experiment which died up to the age indicated.

as comparable as possible on the basis of vigor and weight. The pigs of group I were castrated immediately and those of group II were castrated at four to five weeks of age. The female pigs of these litters were designated as group III. In the first trial, the pigs were weighed individually each week, on either Wednesday or Saturday, according to which day was the closer to the date of birth of the particular litter. During the second trial, only one weigh-day per week was used. Throughout the third trial, the pigs of each litter were weighed at exactly weekly intervals from birth. The weights of the pigs in the first two trials have been corrected for differences in age so that the data are comparable. Weekly weights are complete to the seventh week only, which is about the minimum weaning age of pigs. In all, 411 individuals were started on these trials.

EXPERIMENTAL RESULTS

Trial I: In this trial the mortality was slightly less in group I (birth castrates) at one week of age than in either group II

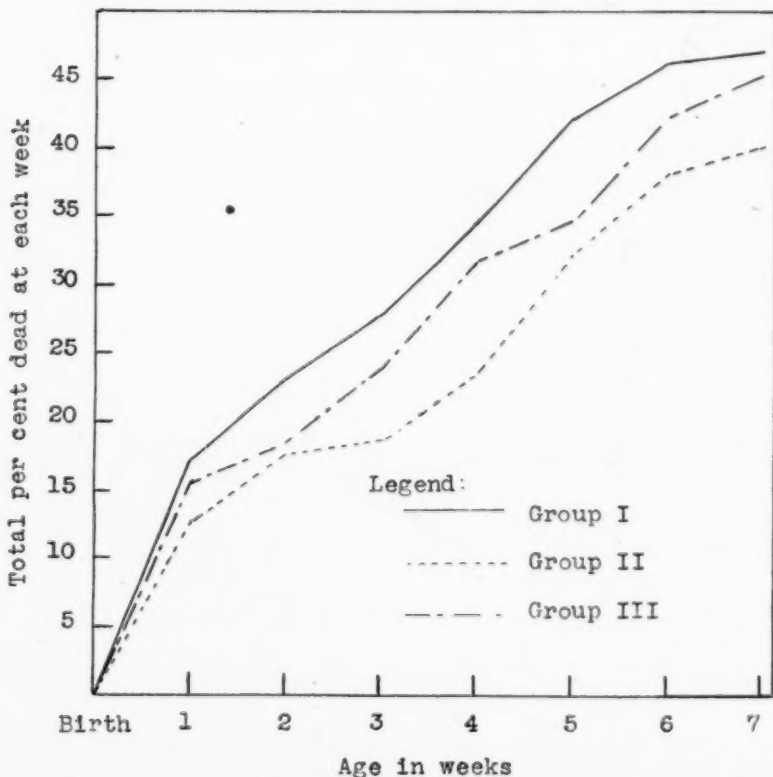


CHART 1. Combined mortality for each week. Total mortality represents the per cent of the number alive at the beginning of the experiment which died up to the age indicated. Group I, birth castrates; group II, 4 to 5 weeks castrates; group III, females.

(month castrates) or group III (females), after which that of group I increased continuously to the end of the experiment, when there was a difference of 12 per cent between group I and group III and 13 per cent between group I and group II. The mortality of groups II and III fluctuated back and forth with respect to each other.

A study of the growth shows that group II slightly surpassed each of the other groups throughout the seven-week nursing period. However, the difference is probably not significant, as the probable errors of the means of each group are high, and so the probable errors of the differences are high. (See table I.)

Trial II: The mortalities of groups I and III run close together and fluctuate with regard to each other throughout the period. However, the mortality of group II is less than that of either of the other groups at each week to the seventh week, when there

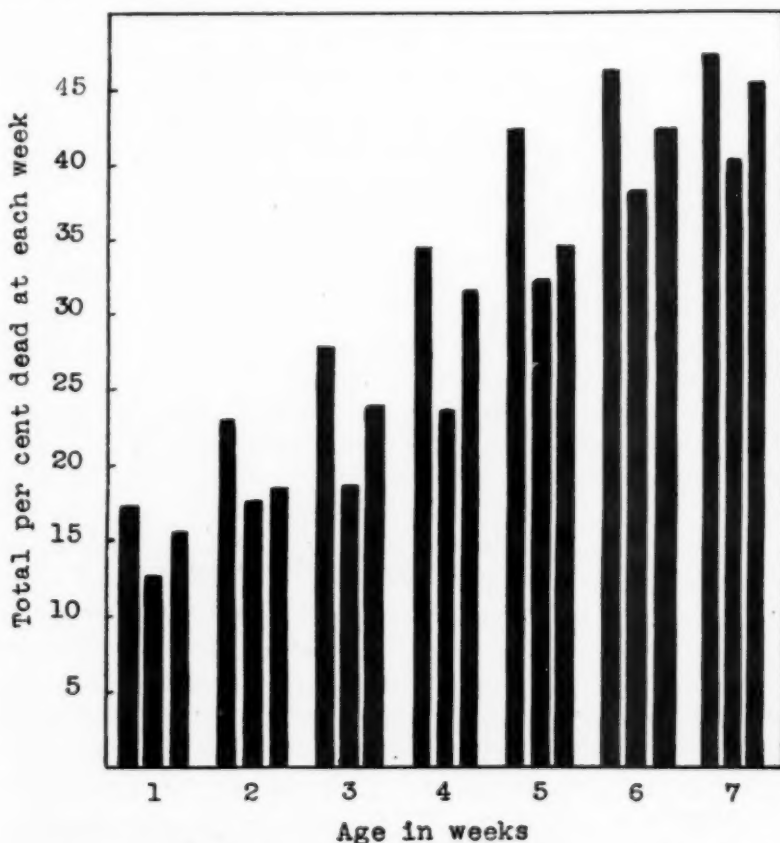


CHART 2. Combined mortality for each week. Of the columns for each week, the one to the left represents birth castrates; the middle one, females; and the one to the right 4 to 5 weeks castrates.

is a difference of 16 per cent between it and group I, and 20 per cent between it and group III.

The growth-curves show that in this trial, group I is higher than either group II or III, but the differences are not significant.

Trial III: In this trial we find that the mortality is higher at

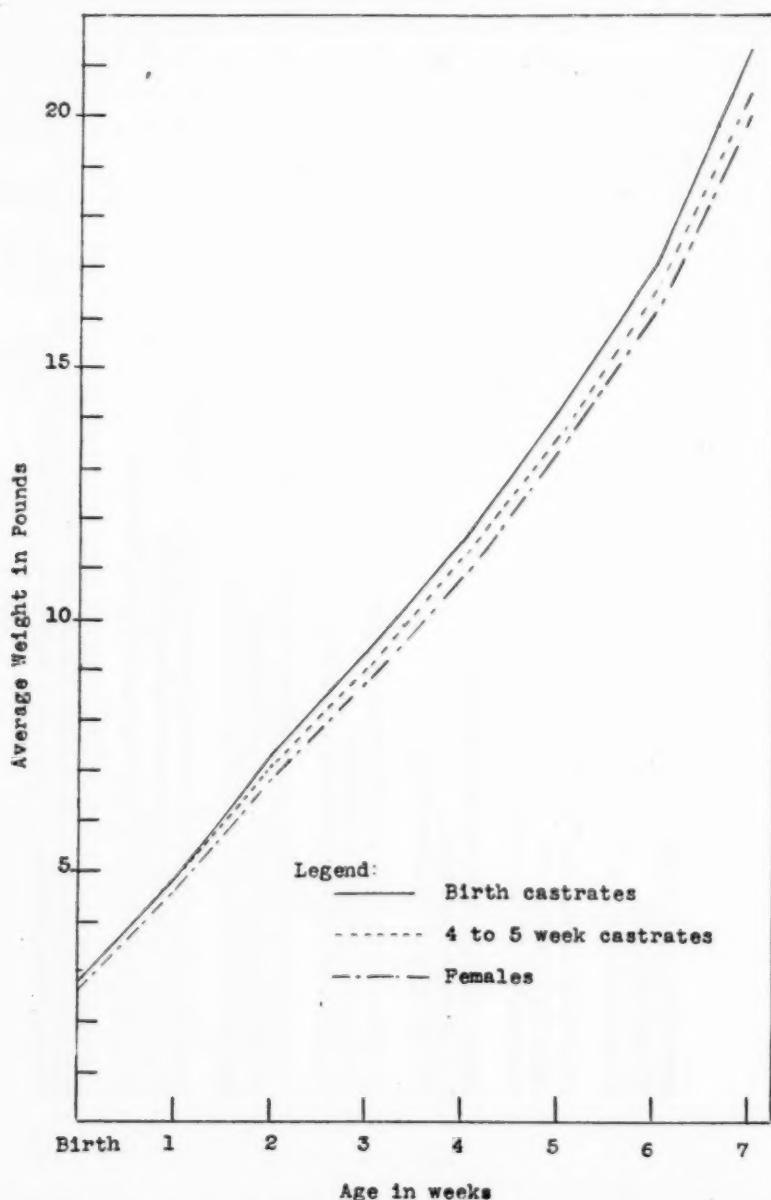


CHART 3. Growth curves of combined trials.

one week of age in group I than in either of the other groups, but that the curves cross each other and do not differ greatly during the latter part of the experiment.

The growth-curves show the three groups so close together that they may be considered the same.

Combined results: The combined mortality figures show that group I is the highest at each week, group III next highest, and group II the lowest. (See charts 1 and 2 and table II.)

The growth-curves, when combined, show group I slightly above group II, but the difference of .9 lbs. found at the end of the experiment is not significant, as the probable error of the difference is $\pm .9$ lbs. (See chart 3 and table I.)

It is of interest to study the correlation between the birth-weights and weaning-weights of the pigs used in these experiments. We have combined the data of all male pigs and worked out the coefficient of correlation. This is $.237 \pm .059$. That of the sow pigs is $.355 \pm .056$. Contrary to expectations, the correlations between birth- and weaning-weights of the two sexes are not high. The difference of .118 between the coefficients of correlation of the two sexes has no significance, as it is only 1.5 times the probable error of the difference, which is $\pm .081$.

DISCUSSION OF RESULTS

Careful observation of the birth castrates failed to show any noticeable effect upon the vigor, yet the figures show that the mortality was greatest in this group at each age. By using a hook castrating-knife, the operation was very easily performed, and by making only a small incision, healing was usually complete within about one week. The individuals castrated at birth seemed to be only slightly inconvenienced by the operation and apparently had a very good start in life. In two cases death was caused by protrusion and incarceration of a loop of bowel into the inguinal canal after operation. These were probably pigs with potential scrotal hernias. These two individuals are the only cases in which our observations lead us to believe that the operation was the direct cause of death. The absence of the testicles *may* exert a slowing-up influence on the vital processes, so as to increase the mortality. Whether this is true or not must be determined by further trial.

It may be definitely stated that no significant difference in the growth can be attributed to the difference in time of castration.

CONCLUSIONS

1. Castration of pigs at birth *may* slightly increase the mortality.
2. Castration at birth or at four to five weeks of age does not cause a noticeable check in the growth of the pig.
3. There is no significant difference in the rate of growth up to weaning-time of male pigs castrated at birth and male pigs castrated at four to five weeks of age.

ACKNOWLEDGMENTS

This work was carried on with the Animal Husbandry Department herd of swine. The writers wish to acknowledge the courtesy of Profs. F. B. Morrison and J. M. Fargo for supplying the experiment animals. Prof. E. Martin, now of the Arkansas Agricultural Experiment Station, was associated with this experiment at its inception, but, on account of illness, was compelled to withdraw.

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THERE SHOULD BE NO PIG IN AMERICA THAT:

Is not born in a sanitary pen,
 Does not live in sunlighted, dry quarters,
 Ever suffers from malnutrition,
 Does not have an opportunity for outdoor exercise,
 Does not have prompt veterinary attention.

—Paraphrased from HERBERT HOOVER
 by F. B. HADLEY.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

TUBERCULOSIS APPARENTLY OF HUMAN TYPE FOUND IN A HORSE

By ROY H. MILLS

*Division of Animal Industry
California Department of Agriculture
Sacramento, California*

The proportionate number of cases of tuberculosis occurring in equines is rather small when compared with its ravages among other species of domesticated animals. Therefore, when this disease is diagnosed in a horse, usually an interest is created in determining its extent in the various tissues and the type of organism responsible for the infection.

The history of the following case is not complete, for the reason that it has not been possible to ascertain the source of the infection. A private practitioner submitted to the Division of Animal Industry, California Department of Agriculture, the following tissues from a horse for a definite diagnosis: sections of spleen, mesenteric and retropharyngeal lymph-glands. In his history of the case he stated that he had been called to the ranch to see the sick animal and, a few days later, when the patient died, he made a postmortem examination and found practically all of the lymph-glands caseous, the spleen showing round, hard, white, tumor-like growths about the size of walnuts and the lungs practically filled with abscesses. His opinion was that death was due to consolidation of the lungs.

The contents of the lesions were grayish-white in color, and of a semi-liquid consistency, with no evidence of calcification. Smears were made and stained with methylene blue, microscopical examination of which revealed considerable contamination with organisms presumably of a saprophytic nature. Plain agar cultures as well as plain potato cultures failed to reveal characteristic pathogenic bacteria. Smears of this material were again made, air dried, fixed with heat and stained by the Ziehl-Neelson method, microscopical examination of which showed

them to be teeming with a finely-beaded organism of the acid-fast group. Some fields showed the organisms clumped together like bunches of sticks. Other smears were prepared and efforts made to decolorize the organisms completely by excessive exposure to the acid-alcohol decolorizing agent, but these bacteria continued to hold the stain.

Three healthy guinea pigs were then selected and injected subcutaneously with an emulsion of the pus-like material. The injections were made subcutaneously, because it was feared that if the material were introduced into tissue where it would be absorbed more readily, the large number of various organisms would kill the animals before lesions of a definite character could develop. Contrary to expectations, the animals withstood the injections without manifesting any discomfort. In about three weeks all pigs showed an enlargement of the precrucial lymph-gland on the injected side, and in about thirty days a typical tuberculous ulcer developed. Smears of the discharge from this ulcer were made and stained by the Ziehl-Neelson method. They were found to contain finely-beaded, rod-shaped organisms, which retained the fuchsin stain. The conclusion was then reached that the horse had died of tuberculosis.

Since a small subcutaneous dose of tuberculin is toxic for a tuberculous guinea pig, and a healthy one can withstand a larger injection of this product, this principle was applied to confirm the diagnosis.

Accordingly, two of the infected pigs were injected with tuberculin, the third being used as a control. In addition, a

TABLE I—*Injections of tuberculous guinea pigs with tuberculin intraperitoneally*

G. P.	CONDITION	WGT. (GMS.)	INJECTED		CONDITION		REMARKS
			TIME A. M.	AMT. (CC)	4:30 P. M. SAME DAY	8:30 P. M. 2ND DAY	
1	Tuberculous	460	11:25	2.0	Very sick	Dead	Died 55th day Remained healthy
2	Tuberculous	452	11:25	3.0	Very sick	Dead	
3	Tuberculous	450	—	—	OK	Alive	
4	Healthy	376	11:25	3.0	OK	Alive	

healthy pig was injected with tuberculin. The results are shown in table I:

As will be noted in the table, pigs 1, 2 and 3 were affected with tuberculosis and pig 4 was a healthy pig.

Pig 1 was then autopsied and pus from some of the tuberculous lesions emulsified and injected into three other guinea pigs. Smears were also made and acid-fast bacteria found. In addition, some of the emulsion was streaked on glycerin agar and incubated. In about seven days, small colonies characteristic of *Mycobacterium tuberculosis* were noted, which grew very slowly. Verification of the character of the growths was made microscopically. In about thirty days, further growth of the colonies ceased.

Pig 3, which was inoculated at the same time as pigs 1 and 2, died on the fifty-fifth day after injection with the emulsion of infectious material.

The three pigs inoculated from pig 1 all developed typical cases of tuberculosis, and a second experiment resulted like the first. The third tuberculous pig, which was not injected with tuberculin, died in about the same time as pig 3 in the first group.

Bacteriologists generally agree that the following morphological differences between the human, bovine and avian bacilli are commonly observed: The bovine type is shorter, straighter and thicker than the human type, and is less apt to show the finely-beaded appearance frequently noted in the latter. The bacillus of avian tuberculosis closely resembles the bovine type in its morphology and staining.

It has been demonstrated that the bovine bacillus is the most highly pathogenic for laboratory animals, the human next, and the avian least (except for birds). Guinea pigs inoculated subcutaneously with bovine bacilli generally die in less than fifty days; those inoculated with human bacilli live more than fifty days. An intraperitoneal injection with the bovine type is fatal in seven to eighteen days, and with the human type in from ten to thirty-eight days.

DISCUSSION

In this case the acid-fast organism studied presented a very finely-beaded appearance, produced typical tuberculous lesions in all guinea pigs injected, four of which were killed with tuberculin on the thirty-ninth day, and two lived fifty days or longer. Slow-growing colonies characteristic of *M. tuberculosis* were also obtained on glycerin-agar slants. Therefore, evidence would indicate that the death of this horse was caused by a generalized infection with tuberculosis of the human type.

PUPS SAVED BY HYSTEROTOMY

By E. A. BUNDY, Ogden, Utah

When I was called to see to a sick Boston Terrier, a short time ago, I found the patient breathing rapidly, mucous membranes cyanotic, intense thirst, and showing a tendency to lie with the legs extended, anteriorly and posteriorly, with the abdomen in contact with the floor. She had vomited a little. The owner assured me that there had been no opportunity for her to ingest any poison and said that she had seemed to be all right that morning. This was about 10 a.m.

As she was due to whelp that day, I at first thought her condition was due to that fact, and that labor pains were causing the uneasiness. But as there was no straining, I decided there was some other cause. I decided to give a little stimulant, which I did, in a half-teaspoonful of water, when she immediately lay over on her side and died without a gasp or sign of a struggle.

Of course, the owner thought I had killed her. After a vain attempt to restore life to the remains, I decided to try to save the babies. I performed hysterotomy hurriedly, as the mother had been dead for probably five minutes, the pups also appeared to be dead, but by the use of artificial respiration, and with the help of a bystander, I was able to save all three of the pups and soon had them breathing naturally. They were wrapped in flannel and warmed by a hot-water bottle.

I then decided to find the cause of the mother's untimely demise, both for my own satisfaction and to square myself with the owner. Postmortem examination showed the stomach distended with gas, but with no solid contents. The walls of the stomach appeared to be normal, but the small intestines told a different story, as they were greatly congested, with thickened walls and bloody contents. The mesenteric glands also were congested. This indicated an irritant poison, and showed that the owner's history of the symptoms was not correct, as she must have been ailing for several hours at least.

I submitted the intestines to the City Chemist for examination. He reported that he was not able to detect the presence of arsenic, but thought it to be a case of powdered glass, although he was unable to demonstrate same.

The unusual part of the case was the normal condition of the stomach and the highly inflamed small intestine.

I have never had a chance to observe the effects of glass after ingestion by the dog. I would appreciate a description of the lesions caused by this.

(According to the reports of tests made during the late war, by officers in the Medical Corps of the U. S. Army, the ingestion of ground or powdered glass has no toxic effect and produces no lesions, either macroscopic or microscopic, in the gastro-intestinal tract of dogs.—EDITOR.)

Lexington! Let's Go!

QUININ SULPHATE FOR TREATMENT OF COCCIDIOSIS IN POULTRY*

*By E. P. JOHNSON, Division of Veterinary Medicine
Department of Bacteriology and Hygiene
Michigan State College, East Lansing*

During the past year, numerous birds brought to this laboratory for diagnosis of disease have been found heavily infested with coccidia, especially birds ranging from four to twelve weeks of age. Some flock-owners have reported losses involving as high as 90 per cent of their flocks. No treatment has been thus far reported as being very efficient for checking this disease.

Knowing the value of quinin as a specific treatment for protozoan diseases, especially malaria in man, it occurred to the writer that this drug might be of some value in combating coccidiosis in poultry. The action of quinin on these organisms has not been definitely determined, but it is thought to be of a specific nature on the sporozoites that leave the oöcyst. Quinin sulphate has been referred to as a treatment for coccidiosis in poultry by Dr. J. H. Patterson,¹ of Hedrick, Iowa, who has noted favorable results following the administration of this drug to birds that showed symptoms of coccidiosis.

In order to determine the value of this drug for combating coccidiosis in poultry, the following experiments have been performed:

Five Rhode Island Red chicks, six weeks of age, were brought to this laboratory with a flock history as follows:

Numerous birds have been acting dumpy, with drooping wings, slightly-bloody alvine discharges and a general unthrifty appearance.

*Received for publication, July 2, 1926. Approved for publication by R. S. Shaw, Director Michigan State College Agricultural Experiment Station.

On autopsy of two of these birds the ceca were found distended with bloody material, a microscopical examination of which revealed numerous coccidia present. A few light-colored areas, varying in size from that of a pin-point up to about one-quarter-inch square, were found in the liver. These appeared to be areas of necrosis.

The remaining three birds were placed in a cage for treatment. A microscopical examination of the droppings of these birds also showed coccidia present. Two of these birds were given one dram of an aqueous solution of quinin sulphate, which was placed directly into the crop by means of a rubber tube and syringe. This dose was given once daily for six days and the birds showed a continuous improvement. On the eighth day both birds appeared fairly normal in every respect. At this time they were autopsied and no gross lesions could be observed in the liver or ceca, nor did a microscopical examination of the contents of the ceca reveal any coccidia present.

The bird that received no treatment died on the third day with typical lesions and numerous coccidia present.

The results were encouraging, but the individual dosing would make the treatment impractical, so it was decided to try out quinin sulphate in the drinking water.

Four White Leghorn chicks, six weeks of age, were obtained with a history of coccidiosis. One bird was autopsied and characteristic lesions were found and numerous coccidia also were demonstrated. They were found also in the droppings of the other three birds. These three birds were placed in a cage and all their drinking-water was treated at the rate of approximately one teaspoonful to a gallon of water. The birds seemed to drink the treated water as readily as water without the drug. One of these birds died on the second day and the autopsy revealed characteristic lesions in the ceca. The organisms were also demonstrated to be present. The other two were kept on this treatment for ten days and continued to improve. These birds are still alive and appear to have made complete recoveries.

Four more White Leghorn chicks, eight weeks of age, with a history similar to the preceding groups, were placed on the same treatment and three of these birds made complete recoveries.

Endeavoring to determine if there would be any danger of birds getting an overdose from this treatment, a normal chick, eight weeks of age, was given one gram of the drug directly into the crop by means of a rubber tube. No ill effects were noted.

The limited number of birds used in these experiments would render definite conclusions inadvisable, but this work suggests that it would be advisable to give this drug a trial in the field of poultry practice.

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Lexington—the Home of Culture and Agriculture

**EXPERIENCES WITH THE USE OF CALF SCOURS
SERUM IN TREATING CASES OF MASTITIS***

By A. C. SPANNAUS, Waconia, Minn.

The object of this paper is merely a report of the several cases treated in practice, and I leave it to your own judgment as to the merits of the use of calf scours serum in the treatment of mastitis.

Case 1: The subject was a grade Jersey cow, weight about 850 pounds; condition about 72 hours standing, affecting the left half of udder, the inflammation extending up to the umbilicus and of an edematous character; temperature, 105.4; animal sluggish, milking curds on affected parts; 60 cc of calf scours serum was administered subcutaneously and instructions left to apply hot fomentations about every six hours, and milking quarters dry of all curds, also to report in three days as to the condition of the animal.

The owner reported that the animal had made a rapid recovery, the swelling disappearing in about eighteen hours and on the third day the milk appeared normal.

Case 2: A grade Holstein cow, weight about 1000 pounds. The history of this case was as follows: Animal had had parturient paresis about three days previously and the owner had inflated the udder with automobile pump and a common milk-tube. The udder was greatly distended, the animal in considerable pain; temperature, 106.8; showed evidence of intoxication, and giving just a serum on milking. This animal was given a purge of one and one-half pounds of Epsom salt, also a No. 10 capsule of formaldehyde, and 75 cc of calf scours serum subcutaneously. Instructions were left to use hot fomentations every hour and massage after bathing.

*Presented at the twenty-ninth annual meeting of the Minnesota State Veterinary Medical Association, Minneapolis, Minn., January 15, 1926.

The owner was requested to keep a record of the temperatures during the night and report to me in the morning. The morning report showed that the temperature had fallen to normal in about six hours after I had seen the animal. The inflammation had subsided a great deal, and the appetite was good. This animal made an apparent recovery in three days, giving seemingly normal milk.

Case 3: A common, grade cow which has considerable swelling after calving. On being called, the owner said that this condition had existed for about a week. He had used hot baths, with no change in the condition. The animal was in good health, milk appeared normal; 50 cc of calf scours serum was injected intramuscularly. The owner reported in two days that the swelling was very much better and described it as follows: "That stuff you used sure was great."

Case 4: A grade Holstein cow, weight about 900 pounds; had freshened and did not produce any milk. Upon examination of the two hind quarters, these proved to be blind, with a great deal of swelling present. A dose of 60 cc of calf scours serum was administered intramuscularly; no noticeable results were obtained.

Case 5: A pure-bred Guernsey cow, weight about 1000 pounds; gave stringy milk, as a rule, several times a week, with seemingly no systemic effect whatsoever. This animal was injected with 50 cc of calf scours serum subcutaneously. Nothing more was noticed from this time, September 16, until December 10, when she had another attack, but not again since then.

Case 6: A grade Holstein cow of about 800 pounds had a case of mastitis involving the whole udder, due to an infection from the continued use of a milk-tube. Upon examination, the animal was very stiff in moving; refused all food and water; temperature, 104.2; severe case of diarrhea and a very listless expression. A quart of castor oil was given, also some stimulants. A dose of 10 cc of camphorated oil and 75 cc of calf scours serum was administered intramuscularly, with frequent fomentations and dry massaging of udder, and request left for a report in the morning. The owner reported that the animal had died that morning.

These are several of the cases treated by myself, taken at random, and different stages and forms presented in practice.

The success of the use of calf scours serum seems to be in the use of it in the initial stages of the disease. I have had no suc-

cess in chronic cases except in two of ten days' standing, which cleared up after the administration. The cases in the majority of instances were of staphylococcic or streptococcic infection.

The serum was used on an average of 5 cc per 100 pounds of live weight and injected intramuscularly or subcutaneously. What curative effect the serum has is rather hard to decide, but it probably is due to a foreign protein.

I would welcome a further discussion on this subject, as mastitis is apparently becoming one of the major problems of a veterinary practitioner in a dairy district and it surely takes its toll in dairy cows, these either becoming totally useless as dairy animals, or three- or two-teaters. Therefore, if we can devise a means of preventing or clearing up these cases with a minimum loss to the owner, we are not only doing what we should, but reducing his losses.

***Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926
Lexington! Let's Go!***

ACTINOMYCOSIS SUCCESSFULLY TREATED WITH IODIN IN MILK

In the *British Medical Journal*, Dr. Hubert Chitty, surgeon, Bristol Royal Infirmary, reports four cases of actinomycosis in the human subject that made complete recoveries following the administration of iodine in milk. Two of the cases were abdominal infections, one of the jaw, and one of the neck and jaw. The dose was 5 to 10 minims of the tincture of iodine in one-half cup of milk, three times daily. It appears that iodine in milk forms a colloidal solution that seems to be more effective than the iodids.

Dr. Chitty says, "I hope this article may attract the notice of the veterinary profession, that a trial may be given of this method of treatment in the case of animals." Will some American practitioner try this and report?

N. S. M.

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

Another "oldest" horse has been located, this one in Henry County, Indiana. It is thirty-six years old and is reported by Dr. R. E. Kepner. It should be added that this horse is a mare and her name is "Rose."

REVIEWS

NATIONAL FORMULARY. Fifth edition. Prepared by the Committee on National Formulary of the American Pharmaceutical Association. Official from July 1, 1926. American Pharmaceutical Association, 1926.

The fifth edition of the National Formulary became official, July 1, 1926, as the standard guide for pharmacy under the federal Food and Drugs Act. The revision was directed by a committee of fifteen members, appointed by the Council of the American Pharmaceutical Association, in 1919, for a period of ten years. Prof. Wilbur M. Scoville, of Detroit, Mich., is chairman. The work of revising the National Formulary has been carried on coördinately with that of the revision of the U. S. Pharmacopeia.

Part I contains formulas. Part II consists of standards for non-pharmacopeial ingredients. Part III contains special tests, reagents and reference tables. The Formulary makes no claims relative to the remedial action of any drug or preparation listed and assumes no responsibility for the therapeutic value of any formula. No proprietary formulas are listed, nor any with trade-marked names. However, it has been the aim of the Formulary to supply formulas as imitations of such articles.

In the preface, the Committee acknowledges the assistance rendered by the A. V. M. A., in connection with veterinary preparations.

Profits on sales of the Formulary will go into a fund of \$100,000 begin raised by the American Pharmaceutical Association for research purposes.

Lexington! Let's Go!

OHIO STATE VETERINARY MEDICAL ASSOCIATION, PROCEEDINGS OF THE. Compiled and edited by Dr. W. R. Hobbs, secretary. Columbus, Ohio, 1926.

Continuing the custom of previous years, the Ohio State Veterinary Medical Association has published the proceedings of the 1926 meeting. If veterinarians in other states could see a copy of this book, undoubtedly a demand would develop for the publication of similar reports. It is really a hand-book, embodying a number of very useful features. Publication annually keeps the material fresh and up to date.

Besides the report of the 1926 meeting, the book contains: the honor roll of the Association, containing the names of twenty-one members who have been in continuous good standing for twenty-five years; officers, past and present; committees; active members (members of the A. V. M. A. are starred); constitution and by-laws; list of registered graduate veterinarians in Ohio, by counties (members of O. S. V. M. A. are starred); organization of the Ohio Department of Agriculture, Division of Live Stock Industry, and of the U. S. B. A. I. in Ohio.

The Association as a whole and Secretary Hobbs individually are to be congratulated upon the publication of this book.

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

ABSTRACTS

RESEARCHES ON THE VIRUS OF FOOT-AND-MOUTH DISEASE. Sir Stewart Stockman and F. C. Minett. Jour. Comp. Path. & Therap., xxxix (1926), 1, p. 1.

This is the first report of several which will appear and embody the results obtained up to October, 1925, by the research committee on foot-and-mouth disease. The studies, principally of a laboratory nature, are extensive and thorough and should be of especial interest to those studying ultra-microscopic organisms in general. Some excellent technics are outlined.

M. J. H.

A Big Meeting, A Big Time and A Big Welcome.

TUBERCULOSIS OF CATS. A. Stanley Griffith. Jour. Comp. Path. & Therap., xxxix (1926), 1, p. 72.

Cultures of *Bact. tuberculosis* were obtained from thirteen cases of casual tuberculosis of cats. The organism is of the bovine type. The author's observations on the pathology of feline tuberculosis show that the paths by which tubercle bacilli are discharged may become the source of infection to man, especially children and other animals. The lungs frequently become tuberculous and the pulmonary lesions are often rich in tubercle bacilli. The tuberculous cat may also be infective through the discharge from tuberculous cutaneous ulcers.

M. J. H.

FURTHER REPORT ON THE INJECTION OF CATTLE WITH B. TUBERCULOSIS (Avian). Cecil Elder and A. M. Lee. Univ. of Wyo. Agri. Exp. Sta. Bul. 140 (May, 1925).

Continuing their work on cattle to prove the relationship between avian and bovine strains of tuberculosis, the authors publish a report of their work conducted on three calves. These calves had previously been artificially inoculated with living cultures of avian tubercle bacilli and in consequence had developed well-marked local lesions at the site of injection, and had also reacted to the intradermal test. The work conducted on these animals was to prove, so far as possible, the following facts:

1. Could the local lesions resulting from artificial inoculation with living cultures of avian tubercle bacilli be removed intact by a surgical operation and, if so, would the animals later react to the tuberculin test?
2. To find out if the structure of these lesions resembled those observed in the skin form of tuberculosis.
3. If there was any tendency towards metastasis or the formation of internal lesions.
4. If the local lesions still contained tubercle bacilli and, if so, if they were alive.
5. If alive, were these organisms pathogenic for chickens?

After the surgical removal of these lesions the following facts were disclosed:

1. All calves failed to react to either the subcutaneous, intradermal or ophthalmic tests, five months later.
2. The lesions removed resembled greatly the lesions which are observed and described in the skin form of tuberculosis.
3. Avian tubercle bacilli tend to remain localized in the subcutaneous tissue, even when introduced in large quantities.
4. Microscopical examination of the local lesions demonstrated the presence of tubercle bacilli in them, eight months after the tubercle bacilli had been introduced.
5. The injection of suspensions made from these lesions and injected into chickens would seem to show that the bacilli was still alive and pathogenic for chickens.

G. W. R.

In the Heart of the Blue Grass
August 17-18-19-20, 1926

DISEASES OF COLORADO FEEDING LAMBS. I. E. Newsom and Floyd Cross. Colo. Agri. Exp. Sta. Bul. 305 (Oct. 1925).

Veterinarians practicing in sheep-raising communities will no doubt be interested in this bulletin, which deals with some of the commoner diseases found in feeding lambs; their cause, symptoms, treatment and prevention. This bulletin is well worth writing for, as the facts contained in it are both of interest and practical value.

G. W. R.

PUBLICATIONS RECEIVED

- Missouri State Poultry Association Year Book, 1925. Mountain Grove, Mo. T. W. Noland. pp. 99.
- Inflamacion de la Ubre de la Vaca (Mastitis). Gobierno de Puerto Rico Departamento de Agriculture y Trabajo Estacion Experimental Insular Cir. 89, Rio Piedras, P. R., 1925. Juan Varas Catala. pp. 7. Illustrated.
- Université de Montreal Annuaire General, 1925-1926, Montreal. pp. 353. Illustrated.
- Why Bacterial Plate Counts of Milk are Inaccurate. Reprint from Dairy Products Merchandising, vi (1926), 5. Archibald R. Ward. pp. 7.
- What Ails Bacterial Counts? Reprint from Dairy Products Merchandising, vi (1926), 6. Archibald R. Ward. pp. 4.
- Further Report on the Injection of Cattle with *B. Tuberculosis* (Avian). Bul. 140, University of Wyoming Agricultural Experiment Station, Laramie, Wyo., May, 1925. Cecil Elder and A. M. Lee. pp. 12.
- Diseases of Colorado Feeding Lambs. Bul. 305, Colorado Agricultural College Experiment Station, Fort Collins, Colo., October, 1925. I. E. Newsom and Floyd Cross. pp. 26. Illustrated.
- Infectious Abortion in Cattle. (Eighth Report.) Some Economic Phases of *Bacterium Abortus* Infection and Other Observations in Dairy Herds. Bul. 135, Storrs Agricultural Experiment Station, Storrs, Conn., December, 1925. Geo. C. White, Robt. E. Johnson, Leo F. Rettger and Jas. G. McAlpine. pp. 22.
- Growth of Veterinary Science and the Application of New Knowledge. Reprint from Cornell Veterinarian, April, 1926. Veranus A. Moore. pp. 9.
- Recent Studies of Bacterial Antigens. Research Bul. 2, Parke, Davis & Co., Detroit, Mich., pp. 8.
- The Calendar of the Ontario Veterinary College, Session 1926-1927, Guelph, Ont. pp. 48.
- Vocational Opportunities for the College Graduate. Michigan State College Bul., vol. xx, 11, June, 1926., East Lansing, Mich. pp. 20.
- Regulations Governing the Inspection and Quarantine of Wild and Domestic Animals and Poultry Imported Into the Territory of Hawaii. Board of Commissioners of Agriculture and Forestry, Div. of Animal Industry, Honolulu, T. H., May 11, 1926. pp. 8.
- Report of the Director of Veterinary Research for the Year 1925. Salisbury, Rhodesia, 1926. pp. 9.
- Catalog of the Michigan State College of Agriculture and Applied Science for the Year 1925-1926. East Lansing, Mich., May, 1926. pp. 342.
- Research in Progress at the University of Minnesota, July 1924—July 1925. Minneapolis, Minn., January, 1926. Clarence M. Jackson. pp. 306.
- Care and Management of Dairy Cows. T. E. Woodward and J. R. Dawson. (U. S. Dept. of Agr. Farmers' Bul. 1470, Washington, D. C., May, 1926. pp. 37.)
- Alabama Polytechnic Institute, College of Veterinary Medicine, Announcement for 1926-1927. Auburn, Ala., July, 1926. pp. 24.
- Bot Flies of the Punjab. H. E. Cross. (Bul. 160, Agricultural Research Institute, Pusa, 1925. pp. 34. Illustrated.)
- Iowa Veterinary Medical Association, Constitution and By-Laws with Directory, 1926. pp. 21.
- Report of the Ontario Veterinary College, 1925. Toronto, Ont., 1926. pp. 77. Illustrated.)
- The Inspection Stamp as a Guide to Wholesome Meat. John R. Mohler. (U. S. Dept. Agr. Misc. Cir. 63, Washington, D. C., May, 1926. pp. 18.)
- City Milk Control. J. D. Brew. Reprint from *Dairy Products Merchandising*, vol. vii, No. 2, June, 1926. pp. 4.

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

Regular Army

Major Herbert S. Williams is relieved from duty as Attending Veterinarian, Washington, D. C., effective about July 5, 1926, and directed to report to the Commandant, Medical Field Service School, Carlisle, Pa., for duty.

Lt. Colonel Robert J. Foster is relieved from duty at The Cavalry School, Fort Riley, Ks., and directed to sail from New York City on September 2, 1926, for the Panama Canal Department and report to the Commanding General thereof for duty with the Veterinary Corps.

War Department orders dated May 26, 1926, directing Captain Earl F. Long to report for duty at The Cavalry School, Fort Riley, Ks., are revoked. Capt. Long will remain at Ohio State University, Columbus, O., as assistant professor of military science and tactics.

Captain Geo. L. Caldwell is relieved from duty at the Presidio of Monterey, effective not later than June 25, 1926, and directed to report to the Commandant, The Cavalry School, Ft. Riley, Ks., for duty.

Captain Oscar C. Schwalm is assigned to duty at the New York General Intermediate Depot, effective on completion of his present tour of duty in the Panama Canal Department about Oct. 30, 1926.

Reserve Corps

New Acceptances

Captain:

Dickerson, Archie Elmer, 225 E. Washington St., Springfield, Ill.

First Lieutenant:

Hogg, James Seeley, 161 Pine Street, Oxford, Pa.
Snortum, Ernest Philip, Canby, Minn.

Second Lieutenant:

Carter, Philip Ray, Bradford, Kansas.
Hurtig, Victor Carl, Delphos, Kansas.
Walgren, Oliver E., 1678 W. Evans St., Denver, Colo.
Williamson, John Wm., 1612 H'ts Blvd., Houston, Texas. (Trans. from FA-Res., eff. May 13, 1926.)

Promotions

Second Lieutenant:

Kirtley Sears to First Lieutenant. Address: 120 East 3rd St., Marysville, Mo.

Separations

First Lieut. Cassius Alson Collins, Bridgeport, Neb., failed to accept reappointment.

Captain Wm. Bernard McGrath, Washington, D. C., resigned.

Second Lieut. C. Lawrence Wrinkle, 336 E. Lafayette St., Stockton, Calif., failed to accept reappointment.

Second Lieut. Marion H. Wills declined reappointment.

VETERINARY R. O. T. C. UNIT TO REMAIN

About the middle of May announcement was made of the fact that the War Department had decided to discontinue the Veterinary Unit of the Reserve Officers' Training Corps at the Ohio

State University, at the end of the college year. This report was given wide publicity by the press.

According to Dean White, the Unit always mustered more than the fifty men required by law, although a number of the men were classed as irregular because they did not have the basic training, and were not counted for this reason. These irregular men came to the Ohio State University with advance credits from other colleges having no military department.

The Act of Congress requires a minimum of fifty men in the Unit. This is unfair to the veterinary schools, when it is considered that there are only a few more than 500 students attending at the present time, while in medicine, for example, there are nearly 20,000 students in the various medical colleges. In order to lower the minimum requirement in the personnel for these units it will require congressional action and opening up the National Defense Act.

Dean White made a trip to Washington in June and was successful in having the War Department rescind the order withdrawing the R. O. T. C. Unit from the Ohio State University. This action insures having the Unit continued for another year. It is feared that unless the enrollment in our veterinary colleges increases, all of these veterinary units may be lost. An alternative would be to have Congress amend the law, permitting twenty-five men in place of fifty to constitute an accredited R. O. T. C. Unit.

ON THE WAY TO LEXINGTON



Farming in the mountains near Williamsburg, Ky. Hillside and bottoms under cultivation. }

COMMUNICATIONS

MINERAL MIXTURES

TO THE EDITOR:

The editorial in the May issue, implying impropriety when we published the article read before the Wisconsin Veterinary Medical Association by Dr. J. S. Koen, on the selling of minerals by veterinarians in practice and which also raises the bigger question of mineral requirements for animals, seems to justify a reply.

The propriety of publishing the paper was settled when that association, believing the subject was an issue in veterinary circles, asked Dr. Koen to present it for discussion and, after listening to its details, accepted it as a contribution. The personal opinion of the editors, which are given in the suffixed comment, has no bearing on the question of propriety, for publishing only such papers as run parallel with editorial opinions is a policy that is not without fault, considering the broad scope of both the technical and professional sides of veterinary medicine.

As regards the feeding of mineral mixtures being a hit-or-miss kind of therapy, there is no argument. It is just that. But, despite the flood of literature broadcast on the subject by august bromatologists, none has yet informed the veterinary practitioner how he is to differentiate between calcium, phosphorus, iodine, potassium, magnesium and whatnot deficiency. The practitioner wants to know this badly, so that he can forthwith prescribe the specific cure.

It is well enough to say "*It is only where a ration is known to be deficient in some one element that there is any need of adding this element to the ration.*" But, what the practitioner wants to know is how to go about the job of finding out what particular element is lacking when confronted with tangible evidence of mineral deficiency; and until definite syndromes are worked out for the veterinarian in this connection he is justified in prescribing mixtures prepared by qualified and reliable dieticians. If the American Veterinary Medical Association is taking the position that feeding minerals is not a worthwhile procedure, then our hats are in the ring, for we have floods of clinical evidence to prove the contrary and to guide us while waiting for scientific explanations of the striking results.

Evanston, Ill.,
June 15, 1926.

L. A. MERILLAT,
Editor, *The North American Veterinarian*.

(Our editorial carried no implication of impropriety in publishing Dr. Koen's article. We expressed a regret that it had been interpreted as an endorsement of the exploitation of the veterinary profession for the purpose of peddling mineral mixtures.

For the benefit of those who are not posted on the subject of mineral deficiencies, we might suggest that an inquiry into the nature of the diet being fed will often give a valuable clue to the element that is lacking from the common feeds and rations. For example, inferior roughage for cows (absence of legume hay) is usually deficient in calcium. The common combination of corn and soy beans, for swine, is notoriously a calcium-deficient ration. The symptoms of iodine deficiency are so well known that they need not be repeated here. To the best of our knowledge potassium and magnesium do not enter into the question very seriously, if at all.

Fistula was listed, in a mineral-mixture advertisement which appeared in a recent issue of one of our veterinary journals, as a condition in which mineral mixtures were indicated. Having seen no published reports on this subject, we assume that they were carried away in the "floods of clinical evidences."

In suggesting that the A. V. M. A. has taken the position that minerals are not essential constituents of any diet, the editor of the *North American Veterinarian* goes a long way to look for trouble. We would suggest that he keep his various articles of head-gear where they belong, just long enough to read our recent editorial again, as well as the one published about a year ago under the title, "Peddlers or Prescribers." Also read our comment on the letter from Dr. D. A. Boardman, published in June, as well as the article of Prof. Maynard, in this issue.

If the veterinary profession wishes to remain on good terms with the live stock industry, we would again suggest that individual veterinarians refrain from trying to get rich on commissions derived from the sale of high-priced, complex mineral nostrums.—EDITOR.)

A Big Meeting, A Big Time and A Big Welcome.

KNEW OSLER AS A BOY

TO THE EDITOR:

Having recently had the pleasure of reading Cushing's *Life of Osler*, I was also very much pleased to see in the July issue of the JOURNAL that our good friend, Dean Giltner, had gone to the trouble to make available to our members phases of Osler's life in which he had intimate contact with veterinary medicine, probably not appreciated by the majority of present-day veterinarians.

When I was a boy, I lived in the town of Dundas, Ontario, and I attended school with Osler, then known as "Billie." He was the youngest son of the Rev. Fetherston Osler (Canon), an episcopal minister. We were in the same classes together from 1857 to 1860. On January 1, 1860, my father moved to the farm and I did not see Osler again until I met him in the lecture-room of the Toronto School of Medicine, January, 1868. It was our first term at college. I had started to take up the study of agriculture and veterinary medicine and he had taken the

medical course, both attending and taking the same lectures on physiology, by Professor Bovell; materia medica, by Professor Thorburn and chemistry lectures at Toronto University, by Professor Croft. Dr. Bovell was Osler's preceptor and the finest lecturer I ever had the pleasure of hearing. I so often think of him.

On my return to Toronto, in 1869, to take up veterinary medicine at the Ontario Veterinary College, Dr. Bovell was not connected with the Toronto School of Medicine. He had resigned and entered the ministry and was assigned to the West Indies, and "Billie" was at the McGill University Medical College, in Montreal. He remained there until he graduated. The next I heard of him he was at the Royal College of Physicians and Surgeons, England. After completing his studies there he went to Edinburgh and then to Berlin.

He then returned to Canada and entered McGill as Professor of Medicine and he also lectured in the Montreal Veterinary College. From that time on he became quite famous (especially after it was reported that he made the statement that a man should be chloroformed at 60 years of age) as a physician and author.

Little did I think when we were both boys, attending common, grammar and Sunday schools together, that he would become so famous and world-renowned. He is certainly an inspiration to young men or women who intend pursuing professional careers. They should read the story of his life.

JOSEPH HAWKINS.

Detroit, Mich., July 6, 1926.

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

SEVEN TEXAS VETERINARIANS EXAMINED

Dr. R. G. Flowers, secretary-treasurer of the Texas State Board of Veterinary Medical Examiners, reports that seven candidates presented themselves for examination for license at the meeting of the Board held at College Station, June 14, 1926, preceding the short course given by the A. & M. College. Three of the candidates were 1926 graduates of the Texas A. & M. College. Fifteen graduates of this institution have taken the State Board examinations during the past year and their general average has been above 85 per cent, which is a reflection of the splendid course in veterinary medicine given at the College.

COMMENCEMENTS

IOWA STATE COLLEGE

Commencement exercises at the Iowa State College were held June 14, 1926. In the Division of Veterinary Medicine, the degree of Doctor of Veterinary Medicine was conferred upon the following:

William J. Bishop	Joe L. Moad
Chih Chang Chen	Clement H. Patterson
Shao Chuang Cheng	Roland A. Sawyer
Charles S. Greer	Otto J. Schrag
Chester A. Hauschen	Sarkis Ter-Michaelian
Earl J. McCausland	Frank Thorp, Jr.
Robert A. Merrill	Carman A. Towne
Henry F. Zingg	

The honor student of the Veterinary Division was Frank Thorp, Jr. During the year Harold J. Classick won the Phi Kappa Phi prize, as the sophomore having the highest average in the College. Walter H. Chivers won the Veterinary Society medal, as the freshman student having the highest average in his class.

OHIO STATE UNIVERSITY

The commencement exercises of the Ohio State University were held June 15, 1926, at the Coliseum, Ohio State Fair Grounds, Columbus. The new President, Dr. Geo. W. Rightmire, presided. The annual address was made by Arthur Meir Schlesinger, Ph. D., Professor of History, Harvard University. Twenty graduates received the degree of Doctor of Veterinary Medicine, as follows:

Alfred Wilbur Anderson	Thomas Brumbaugh Heim
Charles Warren Anson	Leland Clifford Lynch
Clarence Leonidas Campbell	Thomas Harold McMurray
Donald Keith Collins	Chelsea Terrence Paulish
Roscoe Getis Feller	Festus Loren Rogers
Harold Herman Groth	Harrison James Seaman
Fred Carlisle Hamilton	Paul Russell Stanley
William Henry Hammond	Leslie M. Tarbill
Gerald Smith Harshfield	Clifford Christian Wagner
Alfred Orr Haverfield	Cecil Jesse Whitson

Nine of the veterinary graduates received commissions in the R. O. T. C.

STATE COLLEGE OF WASHINGTON

Commencement exercises at the State College of Washington were held June 17, 1926. The following six graduates from the

College of Veterinary Science received the degrees of Bachelor of Science in Veterinary Medicine and Doctor of Veterinary Medicine:

Jean R. Edgar
Marvin R. Hales
Walford J. Johnson

James B. Jones
Temple H. Naylor
William J. Pistor

Dr. Edgar expects to locate in Walla Walla, Wash. Dr. Hales has accepted a state position and will do tuberculin testing and food sanitation work. Dr. Johnson will do relief work for Dr. S. C. Phillip, of Mt. Vernon, and Dr. Peter MacKintosh, of Yakima. Dr. Jones will become associated with his brother, in small animal practice, in Los Angeles. Dr. Naylor had not decided, according to recent reports, just which of several positions he would accept. Dr. Pistor has returned to his home in Oklahoma.

MICHIGAN STATE COLLEGE

The commencement exercises at Michigan State College were held June 21, 1926. Six members of the graduating class received the degree of Doctor of Veterinary Medicine:

Robert Armstrong
Curtiss Betty
Channing Blatchford

Lyle Briggs
Alva R. McLaughlin
George Sturm

At the close of the summer session, August 29, 1925, degrees were conferred upon Robert Learmonth and Adrian Jackson Durant.

At the close of the winter term, March 26, Carl Fox, Harry Downy and Clarence Walquist completed their work, and received their degrees at the regular commencement session, June 21.

Dr. McLaughlin remains as instructor in the Department of Physiology and Pharmacology. He is a graduate of Lafayette College and Princeton University, and has taken work also at Washington State College, Universities of Missouri, Chicago, Wisconsin and Michigan. With one exception, the remainder of the men will go into practice. Requests for graduates to fill positions have indicated that there is a scarcity of well-trained men.

Dr. Robert Armstrong received the prize of \$25.00 offered annually by the Michigan State Veterinary Medical Association for the graduate having the best scholastic record for the senior year.

MISCELLANEOUS

WHY BUY COMMERCIAL MINERAL MIXTURES?

Complex salt mixtures should not be purchased by farmers. For example, there is on the market a product widely advertised for dairy cows which consists of calcium phosphate, sodium chlorid (common salt), potassium iodid, magnesium sulphate (Epsom salt), sodium sulphate (Glauber's salt), ferrous sulphate (copperas), and sulphur. Why should sodium sulphate, sulphur, iron sulphate, or magnesium be added to a dairy cow's ration? If the cow is getting good clover or alfalfa hay, in addition to her grains and silage, the only thing she needs in addition is some common salt, possibly some bone meal or wood ashes, and, if necessary, potassium or sodium iodid to prevent goiter. There is absolutely no need to spend money for any other minerals. "High test" cows are often fed charcoal. This, again, seems a perfectly needless expense, for there is no scientific information that justifies it.

A mineral mixture widely advertised for swine contains the same ingredients as the mineral dairy-cow ration just mentioned, plus charcoal. If swine need some charcoal in winter feeding, then buy charcoal only and not all the other salts in such a mixture. But where hogs can go to a rack of clover or alfalfa hay, no charcoal is needed.

There are other complex mineral mixtures on the market, but none of them have any merit whatever over the unmixed, simple ingredients that live stock need. There is no educational value in using an unknown mixture. To purchase intelligently the salts needed leads in many cases to a better understanding of the problems of nutrition and to a well-grounded knowledge of agricultural science. There is nothing mysterious in these salt mixtures. The materials of which they are made can always be bought more cheaply separately than in the complex mixtures now on sale. Such carriers of phosphorus and calcium that may be needed, under special conditions, can always be bought more cheaply in steamed bone meal, wood ashes, ground limestone, or rock phosphate, than in these mixtures.

(Excerpt from a paper by E. B. Hart, H. S. Steenbock and F. B. Morrison, Wisconsin Agricultural Experiment Station, presented before the Short Course for Veterinarians, University of Wisconsin, January 25, 1923.)

FOOT-AND-MOUTH DISEASE COMMISSION RETURNS

The foot-and-mouth disease commission sent to Europe in 1925 has returned after more than a year's stay. The commission, consisting of Dr. Peter K. Olitsky, of the Rockefeller Institute for Medical Research, Dr. Jacob Traum, of the University of California, and Dr. Harry W. Schoening, of the U. S. Bureau of Animal Industry, is now engaged in writing its report of the survey.

After studying the research work and the control measures employed in eleven European countries, the commission established itself at the Institute d'Hygiene, Strasbourg, and later also at the Laboratoire National de Recherches, Alfort, France. Experimental studies were made at these institutions on the causal agent of foot-and-mouth disease, from its physical, chemical, and biological aspects. Particular attention was given to certain phases of the problem bearing on methods of control of the disease used in this country.

European investigators and officials gave the fullest cooperation and expressed their approval of the commission's work. It is hoped that this effort will result in solving some of the problems of this disease which causes such great economic losses all over the world. The scientists returned at this time because the appropriation for the study lapsed July 1.

In the Heart of the Blue Grass
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HEALTHY ANIMALS DISLIKE TONICS

The medical profession and the veterinary medical profession are opposed, on general and scientific principles, to the administration of tonics to healthy people and animals. Such procedure is unscientific and in practice is always marked with failure. Farmers are giving of their hard-earned money for stock powders, condition powders, and shotgun prescriptions, in the vain hope that they will keep their animals healthy and raise them to make greater gains.

When an animal is sick, the disease should first be diagnosed, and then an appropriate treatment given with the hope and expectation of relief. When an animal is not sick he needs nothing but plenty of good feed and shelter. Giving tonics with the expectation that nature can be coaxed to redoubled effort

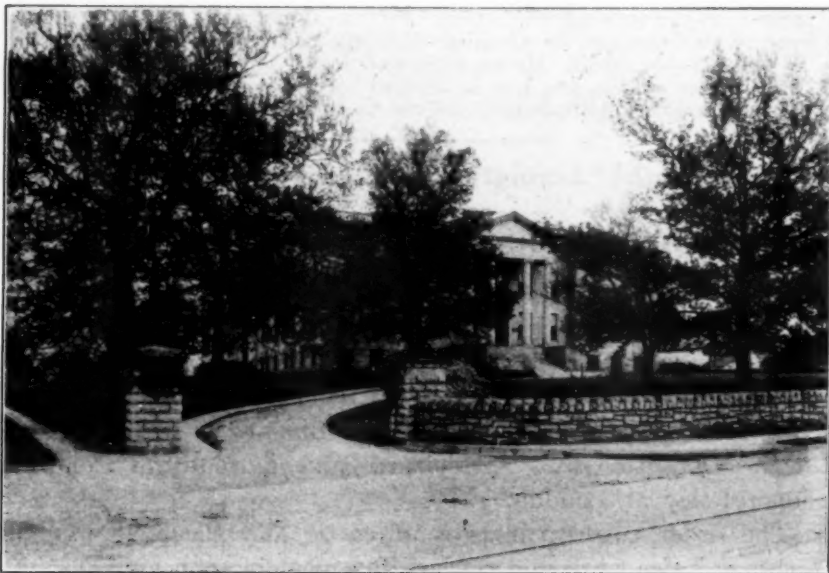
without paying the price later is a delusion and a snare. The law of compensation never fails. Stimulation today means depression tomorrow. Tonics to healthy animals are worse than useless. They are a waste of money.

A balanced ration for animals is a very different matter. This means getting the maximum gains by such an adjustment of nutritive elements that nothing is wasted. My advice is to study balanced rations and forget the tonics.—*George H. Glover, Department of Veterinary Medicine, Colorado Agricultural College.*

MICHIGAN VETERINARIANS ASSIGNED

The following veterinarians have been assigned to tuberculin testing and allied work in the northern counties of Michigan, by the State Department of Agriculture: Drs. D. H. Dickie (Mich. '23), Alger County; H. D. Conrad (Mich. '21), Baraga County; N. D. Bailey (Mich. '24), Dickinson County; Andrew Campbell (Ont. '89), Presque Isle County; B. F. Baldwin (Gr. Rap. '01), Houghton County; G. P. Mayer (Chi. '16), Menominee County; A. F. Logan (Ont. '14), Iron County; H. D. Hilton (Mich. '25), Cheboygan County.

Lexington! Let's Go!



Scovell Hall, Experiment Station Building, University of Kentucky.

WHY GET STUNG?

Under the above heading appeared the following article in a recent issue of *Development Bureau News*, a publication with a circulation of about 5500 in the Upper Peninsula of Michigan. The article was prepared by and published over the signature of Dr. F. K. Hansen, assistant state veterinarian, stationed at Marquette. The article contains an idea that could be used to good advantage in practically any locality. Use it either in whole or in part, whenever the opportunity is presented:

If you are sick, do you go to some traveling doctor or to your regular family physician? Again, if you have to have dental work done, do you go to the traveling dentist, or to some reliable dentist in your home town?

Why not treat your live stock the same way?

I write this because of the fact that there have been in the past some parties traveling the Upper Peninsula posing as specialists in veterinary work, especially dentistry and surgery.

After viewing some of the work that these so-called specialists have done and the price they receive for their work, I am inclined to believe that "there is one born every minute."

In many of these cases the so-called specialists have actually harmed the animals treated. However, they are here and get their money today and are gone tomorrow, so what do they care as to the results of their treatment?

Another class that we have to contend with are the quacks in different localities that pose as veterinarians. They practice veterinary medicine in defiance to the State law and in most cases are ignorant of live stock diseases and the administration of medicine to live stock.

If you question whether one is qualified, ask him to show you his State license and let that be the deciding factor as to whether you will employ him for veterinary work.

Now, who should treat your live stock when sick? There is only one answer to this important question: Your local veterinarian. He is with you at all times and for all calls. Not here today and gone tomorrow. He extends you credit. He has an interest in the outcome of the case and at all times renders you just as efficient service and at a much smaller charge than the "fly-by-night" and the "quack."

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

BRITISH BAN FRESH MEAT FROM CONTINENT

As a result of the discovery of foot-and-mouth disease in hog carcasses from the Netherlands, interned for consumption in Great Britain, the British Ministry of Agriculture and Fisheries has prohibited the landing in Great Britain of all carcasses from continental European countries, according to a cable received in the Department of Agriculture from Agricultural Commissioner Foley at London.

The order covers carcasses of cattle and sheep as well as hogs, and also fresh and refrigerated meat of such animals, but does not cover fully-cured bacon and ham or rendered fat,

cooked or preserved meat or meat essences, or hides and skins which have been dry or wet-salted. Imports from Ireland, the Channel Islands and the Isle of Man are not affected by the order.

Should the quarantine continue any length of time, it will be of far-reaching significance for the meat trade of the United Kingdom, the Netherlands, all northern and western Europe and the United States. The large supplies of fresh pork which have been moving from the Netherlands to the British markets will have to seek other markets or be shipped as cured meat, and Great Britain will be obliged to look elsewhere for its supplies of fresh pork.

In 1924, out of a total British importation of 139 million pounds of fresh and frozen pork, 92 million pounds were from the Netherlands, 20 million pounds from the Irish Free State, and 14½ million pounds from the United States. Of the total of pork supplies in the London Central Markets in 1925, nearly 70 per cent was from the Netherlands. Beef and mutton supplies from the continent of Europe are of minor significance on British markets.

This is the first time that the British Government has prohibited the importation of any kind of fresh meat on account of foot-and-mouth disease, although for several years there has been a strict quarantine against live animals from countries in which the disease was known to exist.

A Big Meeting, A Big Time and A Big Welcome.

FOOT-AND-MOUTH DISEASE ERADICATED FROM U. S.

Effective June 10, all domestic quarantine regulations, previously imposed by the U. S. Department of Agriculture because of foot-and-mouth disease in live stock, were revoked. This announcement applied particularly to California, in which certain areas have been kept under supervision as a precautionary measure. June 10 of this year marked the lapse of exactly a year since the last case of the disease in California was found and destroyed. In the meantime no recurrence of such infection appeared there.

The state of Texas, where foot-and-mouth disease broke out in 1924 and reappeared in 1925, was officially freed from all quarantine, April 1, 1926. The situation in California, according

to veterinary officials of the Bureau of Animal Industry, was more dangerous, owing to the rough and inaccessible character of the land, infection among wild deer, and other unusual conditions.

The official document which declared that foot-and-mouth disease had been eradicated from the United States and no longer exists here is known as Bureau of Animal Industry Order 297, and was signed by Secretary Jardine June 1, to take effect June 10. There still remain in effect the usual restrictions that protect the United States from foot-and-mouth disease and other live stock plagues existing in foreign countries. Such regulations have been made extremely broad and comprehensive and are rigidly enforced.

Lexington—the Home of Culture and Agriculture

MEXICO SUPPRESSING FOOT-AND-MOUTH DISEASE

Mexican authorities have been active in suppressing the recent outbreak of foot-and-mouth disease among live stock in the southern part of that country, according to information received by the U. S. Department of Agriculture through the State Department. Dr. S. O. Fladness, agricultural commissioner for the United States at Mexico City, described the plans of procedure in eradication as similar to those successfully used in the past by veterinary officials of the United States.

Slaughtering of all infected and exposed stock in Yucatan is in progress. Near Yucatan, in northern Campeche and also in southern Tabasco, the infected herds have been slaughtered. A number of infected herds in northern Tabasco, however, still remain to be destroyed. In that region disposal of carcasses by burial is practically impossible, owing to the nature of the land, but Mexican officials recently left for Houston, Texas, to purchase equipment for disposal by burning, the method used successfully in the recent Texas outbreak.

Mexican authorities have also assured United States officials that movement of all dangerous products from the infected region is absolutely prohibited. Dr. Fladness, who has had experience in eradicating foot-and-mouth disease, is cooperating with the Mexican officials in suppressing the malady in that country, thus reducing the menace to the animal industry of the United States.

DR. BLAIR NOW DIRECTOR

"Mann Hatton" is the *nom de plume* of the New York City correspondent of the Philadelphia *Public Ledger*. Recently Mann Hatton interviewed our good friend Dr. W. Reid Blair, at the New York Zoo and paid him the following very fine compliment in a write-up under the title, "Lions and Tigers an Affectionate Lot, but Elephants Have Most Intelligence."

Driving a herd of cows to and from pasture as a boy of 10 near Worcester, Mass., gave Dr. W. Reid Blair, the new director of the New York Zoo, his first interest in wild animals. When he wasn't tending to his herd and to his classroom work he collected and traded birds' eggs, raised guinea pigs and looked at pictures of lions and tigers in big albums.

We interviewed Dr. Blair in his office at the New York Zoological Society's building in Bronx Park, the entrance bearing a sign in large letters, "No Live Animals Inside." Dr. Blair, a man well along in his middle years, has a genial personality. There is nothing about his outward appearances to indicate that the list of his patients treated range from a chimpanzee with a sore tooth, which needed pulling, to a blind rhinoceros. In fact, Dr. Blair is the type of physician one would expect to visit in Park avenue.

Although born in Philadelphia, his family moved to Worcester when he was a youngster. So successful was he in raising guinea pigs that he decided to study animals along lines a trifle more scientific, and with that in view he attended and was graduated from the department of comparative medicine and veterinary science of McGill University, Montreal, in 1902. He came to the New York Zoo twenty-four years ago, when the collection could not even boast of a tiger or lion.

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THE HUMAN ELEMENT IN SAFE MILK

The great state of Illinois is making excellent progress in its work to insure safe milk to its citizens. The dairy herds are being tested for signs of bovine tuberculosis and conditions no doubt are rapidly improving as to the healthy conditions of the cows.

Dr. V. A. Moore, of Cornell University, however, calls attention to the fact that even milk from healthy cows can be contaminated in the handling and pasteurizing. He says that "most important of all is consideration of the health of all persons who handle milk before it reaches the consumer."

Devoted parents will do well to heed this warning of Dr. Moore. They will check upon those who handle the milk as well as the herd from which it comes. Safe milk can do much to build body and mind, while contaminated milk can do much to wreck both.

Champaign (Ill.) *News-Gazette*

A VEST POCKET ESSAY ON BRAINS

By I. K. ATHERTON, College Park, Md.

Brains are a grayish composition with which the attics of some heads, animal as well as human, are filled. While other noodles may contain more or less of this material, they are not bulged out of shape by a surplus. Brains vary in consistency, the same as cheese, although the variance is less in cheese. Some brains are quite valuable. Hog and calf brains, for instance, are excellent articles of food, while well-preserved brains make interesting curios for museums. Scientists tell us that brains of intelligent persons are full of convolutions or folds. If this is a sign of intelligence, it is possible that the brains of some persons would, by comparison, make a billiard-ball look like a porcupine. Brains need exercise the same as any other part of the body, but it is obvious that they do not receive their "daily dozen" as regularly and to the same extent as the average stomach. While every one is proud of the brains he possesses, it is another case of ignorance being bliss, for many would certainly be disappointed if they could see the contents of their think-tank compared with that of a monkey.

All hogs except the road and end-seat varieties have brains. In fact, the four-legged kind, which supply us with pork chops, ham, bacon and "chittlins," possess so much gray matter that they are, when given an opportunity, the cleanest domestic animals on a farm. It is their association with mankind as chattels that has been their undoing. Their voracious appetite has been taken advantage of to compel them to eat dirty material, which they would not touch if given good clean food. Do not expose your hogs to cholera by feeding them garbage, table scraps or kitchen swill, or other material that might contain unsterilized bones, rinds or scraps of pork. Four out of every five outbreaks in Maryland each year are caused by infected pork.

A Big Meeting, A Big Time and A Big Welcome.

A new thought found expression in the *Detroit Free Press* the other day:

Our dog's idea of a balanced ration, containing all the necessary vitamins, proteins, etc., is a slipper. "A slipper a day," says he, "keeps the veterinary surgeon away."

WHAT IS A MULK?

The Hodgenville (Ky.) *Herald-News* recently took the Elizabethtown (Ky.) *News* to task for quoting a news item about mules selling by the pound under a headling reading:

“Mulks Sold By The Pound.”

The *Herald-News* editor went on to say that if a “turken” is a cross between a turkey and a chicken, a “mulk” must be a cross between a mule and a milk animal and therefore appropriately called a “mulk.” “Doubtless,” the editor went on to say, “such a cross would be valued only by the pound.”

Perhaps Dr. Dimock could get these editors to continue the discussion at Lexington, the third week in August. (Editor)

Lexington—the Home of Culture and Agriculture

VETERINARIANS WIN VERDICT

The case of Houk vs Julien and Roth, which has been pending in Indiana for some time, has finally been won by the defendants. Dr. Roth, Lake County veterinarian and Dr. Julien, state veterinarian of Indiana, were sued for damages by a farmer named Houk, when his cattle were quarantined by the veterinary officials. This action followed the refusal of Houk to have his cattle retested at the proper time. The plaintiff based his suit on the fact that he was unable to dispose of his milk while his herd of seventeen cows was under quarantine. The defense testimony was sufficient to convince the jury that the veterinarians acted within their legal duties and that any financial loss suffered by Houk was the result of his own acts.

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TOURING EUROPE

Drs. William J. Lentz and H. C. Campbell, of the University of Pennsylvania School of Veterinary Medicine, are making a tour of Europe. They expect to be away from Philadelphia about ten weeks and will visit a number of the veterinary schools in European countries.

ASSOCIATION MEETINGS

CENTRAL MICHIGAN VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Central Michigan Veterinary Medical Association was held at the Otsego Hotel, Jackson, Mich., May 26, 1926. The meeting was preceded by a special meeting of the Board of Directors of the Michigan State Veterinary Medical Association, called for the purpose of perfecting plans for the approaching annual meeting.

A special program for the entertainment of the ladies had been arranged by Dr. W. N. Armstrong, secretary. This was the first time the ladies were invited and it is quite likely the custom will be continued.

Contributors to the program included Mr. Roy E. Decker, county agent of Jackson County and president of the County Agents Association of Michigan; Dr. E. J. McLaughlin, of the Jackson Health Department; Dr. F. E. Stiles, president of the Michigan State Veterinary Medical Association; Dr. B. J. Killham, state veterinarian; Dr. Ward Giltner, of Michigan State College and Dr. H. Preston Hoskins, secretary-editor of the A. V. M. A. Dr. Fred W. Main, of Albion, presided.

Dr. A. B. Curtice, of Hillsdale, reported the results of the retesting of cattle in Hillsdale County, which had been recently tested for the third time. The number of reactors disclosed was below one per cent, as a result of which the status of Hillsdale County as a tuberculosis-free area remains as before. Dr. Curtice made the very interesting observation that approximately as many reactors had been found in previously-clean herds as were found in herds in which reactors had been found on previous tests.

The meeting concluded with a banquet, at which Dr. Killham officiated as toastmaster. He called upon a number of the ladies present to answer the question: "What is wrong with the veterinary profession?" It seemed to be the consensus of opinion that there really was not very much that was seriously wrong.

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SAN DIEGO-IMPERIAL VETERINARY MEDICAL ASSOCIATION

The San Diego-Imperial Veterinary Medical Association was formed at San Diego, California, May 29, 1926.

The following officers were elected for the ensuing year: President, Dr. H. F. Roberts, San Diego; vice-president, Dr. L. J. Proper, San Diego; secretary-treasurer, Dr. W. G. Oliver, San Diego.

This Association is composed of veterinarians from San Diego and Imperial counties. Meetings will be held regularly on the first Wednesday of each month.

W. G. OLIVER, *Secretary.*

Lexington—the Home of Culture and Agriculture

McLEAN COUNTY VETERINARY MEDICAL ASSOCIATION

A special meeting of the McLean County Veterinary Medical Association was held at the Chamber of Commerce rooms, Bloomington, Ill., the evening of June 4, 1926. The meeting was called to discuss the rabies situation in this territory and the state-wide quarantine placed on all dogs by Dr. F. A. Laird, state veterinarian. The latter was present and reported that rabies was prevalent in sixty-two counties in the State and that the disease was increasing at a dangerous rate. He reviewed Quarantine Order No. 18 and asked for the cooperation of all veterinarians in bringing the seriousness of the situation before local health boards.

Dr. Robert Graham, of the University of Illinois, reported on the increasing number of examinations for rabies being made by the laboratory in his institution. He related some experiences in connection with several outbreaks and warned against slack methods in dealing with the situation. Mr. E. L. Rothwell, of Stanford, related his experience with the disease in his dairy herd. He had lost five cows and the balance of his herd was under treatment. Mr. Rothwell's physician, the Mayor and a member of the Council of Stanford, and the township supervisor attended the meeting.

Dr. Charles F. Schultz, city physician of Bloomington, addressed the meeting and promised his cooperation so far as controlling the situation within the City was concerned. Within

recent weeks rabies has appeared in horses at Lexington and McLean; in cattle at Stanford and Lincoln; in cats at Bloomington and Hudson; and in dogs at several places in and around the County. Four persons are now being given the Pasteur treatment. Local health boards are meeting and formulating control measures.

J. S. KOEN, *Secretary.*

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

WILLAMETTE VALLEY VETERINARY ASSOCIATION

The Willamette Valley Veterinary Association met at McMinnville, Oregon, June 9, 1926. Seventeen members were in attendance.

Several papers were read and discussed very thoroughly. Then a question box was opened and it was here that most of the practitioners got in their best licks. The answers to the questions brought out a very spirited discussion. The meeting then adjourned to the office of Drs. Robinson and Nichols, where a clinic was held. Then the members all drove to the country for the purpose of reading the reactions in a herd of forty-seven cows being tested for tuberculosis.

Keen interest was shown in the meeting from start to finish and all veterinarians in attendance said that they derived considerable benefit from it. As the Northwest Veterinary Medical Association will meet in Victoria, B. C., in August, we will not have another meeting until October. Meetings are usually held on the second Wednesday of every even month.

THOMAS B. CARTER, *Resident Secretary.*

Lexington! Let's Go!

NORTHEASTERN INDIANA VETERINARY MEDICAL ASSOCIATION

Members of the Northeastern Indiana Veterinary Medical Association met at Tri-Lake, Indiana, June 16, 1926, as the guests of Dr. Roy Clark, of Columbia City. Between fifty and sixty veterinarians were in attendance, including Dr. R. C. Julien, state veterinarian. A business session occupied the morning and a basket dinner was served at noon. Dr. C. C. Winegardner, of Goshen, presided.

A Big Meeting, A Big Time and A Big Welcome.

NORTHWESTERN ILLINOIS VETERINARY MEDICAL ASSOCIATION

The spring meeting of the Northwestern Illinois Veterinary Medical Association was held at Stockton, Ill., June 18, 1926. Veterinarians were present from seven counties in the northwestern part of Illinois. Dr. Robert Graham, of the University of Illinois, was the principal speaker. His topic was "Blood Testing of Chickens for Bacillary White Diarrhea." Dr. F. A. Laird, state veterinarian, also discussed this subject.

Lexington—the Home of Culture and Agriculture

INDIANA-ILLINOIS VETERINARY MEDICAL ASSOCIATION

The Indiana-Illinois Veterinary Medical Association held an all-day meeting at Merom, Ind., Chautauqua Grounds, June 18, 1926. In addition to the literary program, a fish fry and picnic dinner, in the beautiful park over-looking the Wabash River, was a main feature of this meeting. Thirty-five veterinarians, their families, and a few distinguished guests made up a good attendance.

At the morning session, routine business was disposed of and officers for the following year were elected: Dr. W. J. Ridgeway, Robinson, Ill., president; Dr. Harry Yocum, Freelandville, Ind., vice-president; Dr. Frank M. Tade, Vincennes, Ind., secretary-treasurer.

After a bountiful noon-day meal, the meeting was called to order again at 1:30 p. m., at which time several good addresses were made by those on the program.

Dr. George H. Roberts, of the Purdue University, presented an able address in which he outlined the technic and methods of some practical surgical operations. He also gave interesting information concerning his duties at the University, including the findings of his research work on contagious abortion of cattle.

Dr. R. C. Julien, state veterinarian, gave an interesting talk on the veterinarian's opportunity to serve mankind through his service to animals. Dr. Julien's talk was prefaced with some highly interesting remarks regarding the scenic and historic features connected with the location of our meeting-place on the banks of the Wabash.

Dr. J. E. Gibson, B. A. I. inspector-in-charge of tuberculosis eradication work in Indiana, made a splendid report on the progress of tuberculosis eradication.

Mr. Will L. TeWalt, secretary of the American Milk Goat Record Association, and publisher of *The Goat World* made an address that was thoroughly interesting and enjoyed by all those present. In his address, Mr. TeWalt pointed out the importance of both the veterinary profession and the milk goat industry and, in convincing manner, showed the mutual benefits which are to be derived from hearty cooperation between the goat-breeders and the veterinarians. All present were eager to absorb the information regarding the branch of the animal industry of which Mr. TeWalt is a promoter.

Dr. T. A. Sigler, of Greencastle, A. V. M. A. representative to the Horse Association of America, ably presented an appeal for the return of horse-breeding to refill the depleted equine ranks.

The final number on the program was a short but pointed statement in which Dr. Criswell expressed his thanks for the cooperation which veterinarians had given him as a member of the federal tuberculosis eradication force, in this district.

FRANK M. TADE, *Secretary.*

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**MICHIGAN STATE VETERINARY MEDICAL
ASSOCIATION**

The forty-fourth annual meeting of the Michigan State Veterinary Medical Association was held at the Michigan State College, East Lansing, June 22-23, 1926. About 125 veterinarians were in attendance, with approximately one-half of them accompanied by their wives.

Much interest was shown in the first number on the program—a horse-pulling demonstration, provided by Professor R. S. Hudson, of the Animal Husbandry Department. This demonstration was scheduled for nine o'clock, in the hope that it would get the members out early. It proved successful in this respect.

This sessions of the meeting were held in the new Union Building. The accommodations offered by this building are ideal for the purpose and no small amount of the success of the meeting can

be attributed to the fact that it was possible to hold practically the entire program here. It was even not necessary to go outside of the building for meals.

The Association was welcomed by Dean Giltner, who briefly reviewed the history of the Michigan State College in general and the Veterinary Division in particular. He asked for the support of all veterinarians in the State in increasing the enrollment of veterinary students. Dr. Judson Black, of Lansing, responded to the address of welcome. After receiving a report from the Board of Directors and acting upon a number of applications for membership, the literary program was taken up.

Dr. A. E. George, of Perry, gave a splendid talk on "Swine Surgery." He covered such matters as restraint, anesthesia, castration, hernia, mammary tumors, cesarean section, and piles. A lively discussion followed.

Dr. H. Preston Hoskins, secretary-editor of the A.V.M.A., addressed the Association in a number of the activities of the A.V.M.A. He outlined the program for the coming meeting in Lexington and expressed the hope that there would be a large attendance of Michigan veterinarians. The subject of liability insurance for veterinarians, obtained by the A.V.M.A., was thoroughly explained by Dr. Hoskins. Michigan's numerical strength in the national organization was referred to and the members were pleased to hear that their State was among the number that showed a gain in membership, during the past three years. Dr. Hoskins said that it would take at least a half dozen more new applications to insure Michigan's standing for this year and later in the meeting he reported that ten new applications had been obtained, largely through the efforts of Dr. B. J. Killham, resident secretary of the A.V.M.A. for Michigan. The work being done by the Committee on Schmidt Memorial was explained and the Association voted an appropriation of \$75.00 to the fund. Dr. A. McKercher, of Lansing, was selected to represent the Association at the conference to be held in Lexington, the evening before the meeting.

After luncheon, Dr. R. L. Tinkham, of Chicago, gave a splendid address on "Small Animal Practice." Dr. Tinkham covered his subject in a very comprehensive fashion and stressed the importance of the small animal practitioner maintaining his status as a professional man. Dr. Tinkham paid special attention to the management of a small animal hospital and related many personal experiences in connection therewith. In speaking of dog typhus

and canine distemper, Dr. Tinkham reported favorable results attending the intraperitoneal injection of 20 cc of a neutral solution of acriflavine. He prefers luminal for convulsions in dogs. He described the operation for lowering the tail, in police dogs, as well as that for entropion, in Chows. Dr. Tinkham prefers the lightest possible splint dressings for fractures. He also favors local anesthesia with butyn and prefers the flank operation for cesarean section. He expressed a preference for performing ovariectomy with the spaying-hook, rather than with the fingers for the reason that the wound heals a little bit more quickly. He concluded with remarks on the treatment of pyometritis and cecectomy. Opinions were freely expressed to the effect that Dr. Tinkham's address was one of the most interesting and valuable ever given before the Association.

Dr. W. R. Hinshaw, of the Kansas State Agricultural College, presented "Deficiency Diseases of Poultry," particularly as these conditions are met in the state of Kansas. The avitaminoses A and D were covered very thoroughly, as these are the most important in poultry. Dr. Hinshaw named the various foods which are likely to be deficient in vitamins A and D, as well as those which are particularly rich in these vitamins. The following day, Dr. Hinshaw presented "Diagnosis of Poultry Diseases," illustrated with lantern-slides. Some of these showed a number of rather unusual pathological conditions met in poultry.

The program Tuesday afternoon was concluded with an illustrated address by Dr. E. T. Hallman, on "The Retention of the Fetal Membranes in Cows." Dr. Hallman has been conducting some original research work in connection with this condition, with a view to determining, if possible, the most logical treatment for this common disease. Dr. Hallman briefly described experiments under way to determine what drugs or chemicals are best suited to prevent putrefaction in the uterus following parturition, without interfering with the probable enzyme action which assists in bringing about the loosening and expulsion of the membranes.

In the evening a dinner-dance was enjoyed in the ball-room of the Union Building. The banquet was featured by two toastmasters, Drs. B. J. Killham and Ward Giltner, who took turns in calling upon the different speakers. Among those who responded were Dr. Tinkham, Dr. and Mrs. Hinshaw, Professor O. E. Reed, of the Dairy Department, and Professor King, of the English Department.

Wednesday morning the program was opened by Dr. H. E. Defendorf, of Grand Blanc, who reported a number of tracheotomies for the relief of bronchial choke in horses. He reported good results in handling his cases by performing a very low tracheotomy, stating that the foreign substances and secretions that had collected in the trachea and larger bronchi would be promptly dislodged by the animals coughing and immediate relief would be obtained.

Dr. H. A. Tobin, of Three Rivers, discussed the subject of "Open Joints." He explained his methods of handling this condition in large animals and his talk was followed by a free discussion on the part of a number of veterinarians present.

Dr. Joseph Hawkins, of Detroit, read a paper outlining some of the early history of the veterinary profession in Michigan. This proved to be very interesting, particularly to the younger veterinarians present.

Wednesday afternoon, Dr. W. F. Martin, of the Battle Creek Sanitarium, addressed the Association on the subject of "Glandular Therapy." His address was very instructive and highly entertaining. He mentioned all of the glands of internal secretion and explained their relation to sterility in the male and female. Dr. Martin's remarks showed that the sterility problem is not one that is peculiar to the veterinary profession alone. Dr. Martin recently spent a year in Europe, part of which was spent with Dr. Steinach, of rejuvenation fame. Dr. Martin related some of his experiences in this connection, which were both enlightening and amusing.

Dr. M. D. Ducey, of Merrill, concluded the program with a discussion on "Forge Poisoning in Cattle." Dr. Ducey has had rather unusual success in treating this condition and he outlined his method of procedure in different types of the disease. He relies a great deal on barium, potassium permanganate, nuxvomica and diffusible stimulants.

The election of officers resulted as follows: President, Dr. W. E. Coomer, Bay City; 1st vice-president, Dr. L. A. Wileden, Mason; 2nd vice-president, Dr. W. N. Armstrong, Concord; 3rd vice-president Dr. John Schaefer, Bangor; secretary-treasurer Dr. E. K. Sales, East Lansing; member of the Board of Directors, Dr. H. E. Erickson, Charlotte.

E. K. SALES *Secretary.*

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

EASTERN STATES TUBERCULOSIS CONFERENCE

The seventh annual Eastern States Tuberculosis Conference was held at Burlington, Vermont, June 22-23, 1926, at which time nearly four hundred veterinarians, sanitarians, public health officials, live stock breeders and dairymen, together with their wives and friends, assembled in Burlington on the banks of Lake Champlain, considered by many New Englanders as the most beautiful city in the United States. The weather was perfect and the visitors from out of the State marvelled at hospitality of the Vermont veterinarians.

On Monday evening scores of veterinarians assembled at the Hotel Vermont, the headquarters for the conference, to renew acquaintanceship. The conference opened Tuesday morning in the dining-room of the Van Ness Hotel, with Dr. J. A. Rust, president of the Vermont State Veterinary Medical Association, presiding. Dr. Rust welcomed the conference to Vermont and presented Hon. E. H. Jones, Commissioner of Agriculture, Montpelier, Vt., who, after a short address, introduced the Governor, Hon. Franklin S. Billings. Governor Billings discussed tuberculosis eradication work in the state of Vermont and from his remarks it was plainly shown that he was deeply interested in the subject. In fact, he said it was a part of his campaign issue in the last election. Hon. A. L. Felker, Commissioner of Agriculture of New Hampshire, responded to the address of welcome. Mr. Felker is one of New England's best orators and can always be depended upon to arouse an audience and he did not fail on this occasion.

The object of the Conference was outlined by Dr. John R. Mohler, Chief of the U. S. Bureau of Animal Industry. Dr. Mohler gave a brief history of the project from 1917 up to the present time. On account of Congress being in session Hon. E. S. Brigham, who represents the First District of Vermont and was a former Commissioner of Agriculture of that State, was unable to be present but the history of tuberculin testing in Vermont was splendidly presented by his successor, Hon. E. H. Jones. The Commissioner, in outlining the history of the work, referred to a map of the State, which outlined each township and as he told of the progress in area testing, the exact conditions were shown by an electrical appliance which was operated by an assistant, who flashed the lights indicating the modified accredited areas, those in the process of testing at the

present time, and all others where petitions were being circulated, etc. This ingenious map was commented on many times by the press. Dr. Marion Dorset, Washington, D. C., followed with an address on tuberculin. Dr. Dorset's paper was followed very closely by the veterinarians present and it is hoped that this work may be preserved for reference, especially for veterinarians employed in tuberculosis eradication work. Dr. J. H. McNeil, Chief, Bureau of Animal Industry, Trenton, N. J., was unable to be present but his paper on "The Progress of Tuberculosis Eradication in New Jersey" was read, following Dr. Dorset's address.

Dr. J. A. Kiernan presided at the afternoon session, which was opened by an address of welcome by Dr. C. H. Beecher, Mayor of Burlington, Vermont. Dr. Beecher is an active practitioner, as well as Mayor, and gave the conference a hearty welcome to their beautiful city, but unfortunately the Doctor has not given the matter of bovine tuberculosis eradication very much thought or study from a public health viewpoint. Dr. A. J. DeFosset, a former inspector-in-charge of tuberculosis eradication in Vermont, outlined the plans of area work in Ohio. Dr. DeFosset was busy at the conference, meeting many of his old friends. Hon. J. M. Whittlesey, Commissioner on Domestic Animals, Hartford, Conn., gave a brief outline of the work in Connecticut and was followed by Dr. S. E. Bruner, of Harrisburg, Pa., who read a splendid paper on the progress of the work in his state. Dr. Bruner had several maps to which he frequently referred and a discussion of this splendid paper was exceedingly interesting.

Mr. C. W. Wilson, Superintendent, State Industrial School, Vergennes, Vt., spoke on tuberculosis eradication from a breeder's viewpoint. Mr. Wilson outlined the conditions several years ago in a herd at the school, where a large number of reactors were found, but today they have one of the largest pure-bred Ayrshire herds in the State and have had a tuberculosis-free accredited herd for several years. The progress of tuberculosis eradication work in Massachusetts was outlined by a paper written by Dr. Lester H. Howard, Director, Division of Animal Industry, Boston, Mass., and read by Dr. Harry W. Peirce, Deputy Director. The conditions in Massachusetts were shown to be unlike that of the other eastern states and the accredited-herd work has been retarded for several reasons, chiefly the heavy infection within the State, the lack of sufficient federal funds for the

payment of indemnities, and the difficulties in obtaining healthy animals for replacements, which, in many instances, required a replacement of the entire herd.

Mr. James Watson, Field Editor, New England Homestead, Springfield, Mass., gave a splendid talk on the farm journal and its views on tuberculosis eradication work. Mr. Watson indicated that the farm journals throughout the country were now solidly back of this program and while the paper he represented was open at all times to receive criticisms, there has been an entire change in the farmer's attitude and but a few letters of criticism were now received. Dr. James S. Healy, B. A. I. inspector-in-charge, Madison, Wis., presented a history of tuberculosis eradication work in that State and, from his paper and a map outlining what has been accomplished in Wisconsin, it was a revelation to many of the audience, not familiar with tuberculosis eradication work in the Middle West, to see the large part of this State which was in the modified accredited area.

A very optimistic report was made by Hon. H. M. Tucker, Chief of the Bureau of Animal Industry, Augusta, Maine, on tuberculosis eradication work in that State. Apparently the infection is very light throughout the State, with the exception of one small area. This closed the first day's program and in the evening a banquet followed by a dance was held in the beautiful dining-room of the Hotel Vermont, attended by 175 guests. The spirit of the holiday was shown throughout the banquet and the dance, which lasted until well after midnight.

Wednesday morning, Dr. Robert Weir, of the Vermont Veterinary Medical Association, presided. The first address of the day was by Prof. Thomas Bradlee, Chief, Extension Service, University of Vermont, and his subject, "Cooperation All Along the Line," brought out many points which showed to the audience that this entire program was one affecting nearly every profession and industry in the nation and could be brought to a successful conclusion only by the cooperation of all agencies. Dr. E. T. Faulder, of Albany, N. Y., startled many of the members of the conference who were not familiar with the progress of tuberculosis eradication in the Empire State. Dr. Faulder also presented a map, showing the progress of the work in New York, and outlined a program which the officials in charge have laid out to make this great state entirely free from tuberculosis in the near future.

Hon J. B. George, Commissioner of Agriculture, Baltimore, Md., presented a paper on the outlook in his State, which was optimistic and, notwithstanding the heavy infection in some areas, real progress was being made in the eradication of tuberculosis in Maryland. Dr. E. C. Schroeder, Superintendent, Experiment Station, Bethesda, Md., followed with an address giving in detail many of the experiments made at the farm, and the conference followed him very closely. Prof. R. H. Smith, Live Stock Commissioner, Chicago, Ill., spoke on the subject of tuberculosis eradication from an economic viewpoint. Prof. Smith told of the importance of this work, not only as an economic project for the farmer, but for the packing industry, which is extremely interested in this campaign and assisting in every way. He spoke of the premiums being paid on hogs coming from modified tuberculosis-free areas and also of the work of the committee before Congress, to increase appropriations for indemnity on tuberculous animals.

Dr. Harris Moak, secretary of the National Certified Milk Producers' Association, Brooklyn, N. Y., presented a paper on "The Importance of Bovine Tuberculosis Eradication in the Production of Raw Milk." Much stress was laid by Dr. Moak on the importance of removing every tuberculous animal from the herd, even if it was necessary to supplement the tuberculin test with other methods and he described the cupping method to the audience, many of whom were not familiar with this method of diagnosing tuberculosis. Dr. T. E. Robinson, State Veterinarian, Providence, R. I., gave a short talk on the progress of tuberculosis eradication work in Rhode Island. This state has been rather backward in this particular work, but Dr. Robinson outlined the new legislation which was secured at the recent session of the legislature. This provides for cooperation with the federal government in tuberculosis eradication work and indemnifying farmers for their losses, an appropriation of over \$100,000 having been made for this fiscal year. He also told of the new law which would help to protect the interstate movement of cattle into the State.

The final session of the program was opened Wednesday afternoon and Dr. T. A. Rich, of the University of Vermont, presided. The first paper was given by Dr. J. A. Kiernan and was a resume of the work throughout the eastern states. Dr. George E. Corwin, Deputy Commissioner on Domestic Animals, Hartford, Conn., addressed the conference on the combination

test. Dr. Corwin's paper was discussed by Dr. R. W. Smith, State Veterinarian, Concord, N. H., Dr. J. B. Reidy, Harrisburg, Pa., and Dr. E. A. Crossman, Boston, Mass. Dr. Corwin's paper was exceedingly interesting and he showed his hearers that success in accredited-herd work could not be attained without depending on the different tuberculin tests in combination.

Dr. W. K. Lewis, State Veterinarian, Columbia, S. C., told of the problems met in that State, which were not as difficult apparently as the problems in the badly-infected eastern states. The final part on the program was an address by Dr. Geo. Hilton, Veterinary Director General, Ottawa, Can., on "Eradication Work in the Dominion." Dr. Hilton gave a splendid address and quoted figures which prove that the conditions in Canada are not unlike those in our own country. Dr. Hilton amused the audience by his continual quoting of figures, especially without reference to any memoranda, and one was inclined to think of Gen. Lord, giving an address on the Bureau of the Budget.

No definite conclusion was arrived at regarding the meeting next year, but a committee was appointed to arrange for a conference and Dr. J. A. Kiernan was appointed chairman of the committee. Suggestions were made that the Conference be held in either Pennsylvania, New Jersey or Maryland.

A committee, of which Hon. E. H. Jones is chairman, was appointed for the purpose of printing and distributing the proceedings of the conference. We believe that every veterinarian in the United States who is interested in tuberculosis eradication will want a copy of the proceedings. In fact there are many papers which are of interest to all veterinarians and other public officials.

The ladies were entertained by a local committee, on Tuesday afternoon, with an automobile ride as guests of the Burlington Chamber of Commerce. Many places of interest within fifty miles of the City were visited, including Fort Ethan Allan and the Grand Islands. On Wednesday morning 75 ladies were the guests of the committee on a boat-ride across Lake Champlain to Ausable Chasm, New York, and the surrounding territory. This was an all-day trip and a bounteous dinner was provided the guests at the hotel at the Chasm.

Each Eastern States Conference has been extremely interesting and educational and many of the members felt that this, the

seventh, was perhaps the very best and we are looking forward to making the eighth conference even better.

E. A. C.

A Big Meeting, A Big Time and A Big Welcome.

**SOUTHERN MINNESOTA VETERINARY MEDICAL
ASSOCIATION**

On June 24, 1926, a group of veterinarians met in the Chamber of Commerce rooms, Faribault, Minnesota, and organized a local association to be known as the Southern Minnesota Veterinary Medical Association. It is planned to hold monthly meetings. No meeting was held in July, on account of the summer meeting of the Minnesota State Veterinary Medical Association, but the first regular meeting will be held August 18. Officers have been elected as follows: President, Ralph L. West, Waseca; vice-president, Dr. L. E. Stanton, Owatonna; secretary-treasurer, Dr. Carl Hansen, Faribault.

RALPH L. WEST, *President.*

Lexington! Let's Go!

**NORTHEASTERN PENNSYLVANIA VETERINARY
MEDICAL CLUB**

The Northeastern Pennsylvania Veterinary Medical Club held a meeting on June 26, 1926, at the Spring Grove Hotel, Lake Carey, which is located about four miles outside of Tunkhannock, Pa. Sixteen veterinarians were in attendance. Dr. John W. Adams, of the University of Pennsylvania, gave a talk and demonstration on "The Surgery of Cattle," which was very instructive to all those present.

Dr. H. R. Church, Deputy State Veterinarian, was present, along with several other officials from the Pennsylvania Bureau of Animal Industry. The wives or sweethearts of the members, to the number of fifteen, were also present and, while the members were in session, enjoyed the surroundings and boating very much.

THOS. D. JAMES, *Secretary.*

***In the Heart of the Blue Grass
August 17-18-19-20, 1926***

POULTRY SCHOOL AT CORNELL UNIVERSITY

During the annual conference for veterinarians held at Ithaca in January of the present year, a desire was expressed by several veterinarians that there be held a school where they might find opportunity to spend a few days in study of the diseases of poultry. Drs. V. A. Moore, E. L. Brunett and H. J. Metzger responded to that request by organizing the two-day school which was held July 1-2, 1926, at the New York State Veterinary College.

Cornell University has been a pioneer in many things along educational and scientific lines and not the least of these has been the advancement of education in veterinary medicine. Dean Moore and his co-workers have long realized the necessity for greater participation by the veterinarians in the control of the diseases of poultry. Increased facilities for research and teaching have been early responses to this need. Conducting a poultry school for men who have not had the opportunity for the more recent study is another step in advance.

During the forenoon of the first day the laboratory method was used in the study of postmortem technic and a brief consideration was given to the anatomy of the fowl. A most particular advantage in this laboratory session, as well as the ones that followed, was the participation of the practitioners in attendance in the actual work. Dr. V. A. Moore then gave an instructive and interesting lantern-slide demonstration of the poultry diseases common to New York State. The interest manifested in this demonstration was shown by the frequent interruptions with questions relative to the disease discussed. Dr. E. L. Brunett and Dr. H. M. DeVolt completed the work of the morning with a laboratory demonstration of bacillary white diarrhea.

Beginning the afternoon session, Dr. Brunett and Dr. DeVolt conducted a laboratory study of fowl cholera. To complete the very practical aspect of the afternoon program two members of the Department of Poultry Husbandry, College of Agriculture, Cornell University, gave talks. Professor J. C. Huttar talked on the "Housing of Poultry" and Professor R. C. Ogle spoke on the "Feeding of Poultry." These were very helpful and instructive numbers.

During the morning of the second day Dr. Brunett and Dr. DeVolt continued the laboratory demonstrations with specimens

demonstrating symptoms and diagnosis of avian tuberculosis, coccidiosis and intestinal worms in poultry. Two speakers occupied the time of the program for the afternoon of the second day. Dr. J. M. Hendrickson, in charge of poultry research at the New York State School of Applied Agriculture at Farmingdale, L. I., talked on "Drugs Which May be Used in a Poultry Practice." Dr. L. M. Hurd, Department of Poultry Husbandry, Cornell University, gave a talk entitled, "Culling Chickens for Egg-Production and Breeding."

The attendance was better than anticipated. The interest was high. Those in attendance felt that the work had more than come up to expectations and hoped for future opportunities for more of such practical and helpful work.

C. E. HAYDEN.

Lexington—the Home of Culture and Agriculture

CALIFORNIA STATE VETERINARY MEDICAL ASSOCIATION

The annual meeting of the California State Veterinary Medical Association was held at the Clark Hotel, Los Angeles, June 28-29-30, 1926. The meeting was highly successful from every standpoint, and the attendance good, approximately ninety veterinarians registering.

The meeting opened with a short address of welcome by Mr. Howard Miller, of the Live Stock Department of the Los Angeles Chamber of Commerce. The ensuing program was of a general nature, the papers presented touching upon various phases of veterinary medicine.

The entire second day was spent at the small animal sanitarium of Dr. T. H. Agnew, of Pasadena. It was a real pleasure for those present to see the establishment which Dr. Agnew has built up. It is ideally situated and well adapted for holding clinics for a large group. His equipment is of the latest type throughout, and the sanitarium as a whole approximates those for human patients. The program consisted of a surgical clinic upon small animals and included a number of instructive surgical operations. These were interspersed with questions on all phases of small animal practice. A box-lunch was served under the shade of the trees in the spacious yard, after which the program continued late into the afternoon.

In the evening the annual banquet was held at the Elks' Club; a highly entertaining program was offered and dancing enjoyed by all.

The final day's program was devoted largely to topics dealing with public health. Dr. J. J. Frey, in his talk, urged upon the Association the need for ethical advertising by the profession. As a result of the timely suggestions in Dr. Frey's talk, a committee has been appointed to investigate ways and means of bringing before the public, in an ethical manner, the value of veterinary service.

Officers elected for the ensuing year are: President, L. O. Henrich, Corcoran; vice-president, J. P. Iverson, Sacramento; secretary, E. H. Barger, Davis; treasurer, James Boyd, San Jose.

The meeting adjourned to convene at Davis, during the conference for veterinarians, in January, 1927.

E. H. BARGER, *Secretary.*

A Big Meeting, A Big Time and A Big Welcome.

ILLMO VETERINARY MEDICAL ASSOCIATION

The Illmo Veterinary Medical Association held a picnic at the Marissa (Ill.) Country Club, July 1, 1926. About sixty-five veterinarians from southern Illinois and southeastern Missouri, accompanied by their families, were in attendance. Swimming, boating, fishing, horse-shoe pitching, games and races of various kinds occupied the day. Everybody had a good time.

Lexington! Let's Go!

LONG ISLAND VETERINARIANS STUDY POULTRY DISEASES

A meeting of the veterinarians of Long Island was held at the State Institute of Applied Agriculture at Farmingdale, Long Island, for the discussion of poultry diseases, June 24, 1926. Dr. J. M. Hendrickson, of the New York State Veterinary College, Cornell University, who is in charge of the diagnosis of poultry disease at the Farmingdale Institute, gave helpful demonstrations and Dr. V. A. Moore, dean of the College, was present and made a statement concerning the situation relative to poultry disease control in New York State. In the evening, Dr. Moore addressed the Long Island Poultry Association, illustrating his talk with a number of lantern slides.

NECROLOGY

STEWART STOCKMAN

Sir Stewart Stockman, Chief Veterinary Officer of the Ministry of Agriculture of Great Britain, died suddenly, June 3, 1926. He was elected an honorary member of the American Veterinary Medical Association in 1913. In commenting upon his untimely death, *The Times* (London) paid this distinguished veterinarian the following tribute:

Sir Stewart Stockman was born in 1869, the fourth son of Mr. William John Stockman, merchant, of Edinburgh and Leith. He received his early education at the Edinburgh High School, and his professional training at the Royal (Dick) Veterinary College, Edinburgh, from which he qualified as a member of the Royal College of Veterinary Surgeons in 1890. Afterwards he underwent an ideal form of apprenticeship for the assumption of the onerous duties with which his name became prominently associated in later life, first as a research assistant and teacher, and, secondly, as an executive officer in the control of outbreaks of animal disease in countries abroad, where the problems of epizootology are a formidable menace to the welfare of the populations of the countries. After graduation he studied at the Ecole Nationale Vétérinaire, Paris, and then occupied the posts successively of Demonstrator of Pathology and Professor of Pathology at the Royal (Dick) Veterinary College, Edinburgh. During these years he worked in intimate association with the great pioneers of the science of animal pathology, Nocard, in France, and M'Fadyean, in England, and it is doubtless due to the early tuition received from these masters that he achieved his high international reputation later as an experimentalist, and as a shrewd and careful observer.

He resigned his scholastic appointment in 1900 to serve in the South African War, and after the termination of the war accepted a post in the Indian Civil Veterinary Department, which had then just been opened to direct recruitment with civilian veterinary surgeons. His stay in India, though brief, was marked by the execution of some valuable pioneer work upon the methods of controlling disease in that country; in particular, his observations upon cattle plague (rinderpest) in the country are of a very high order. In 1902 he was appointed Principal Veterinary Officer to the Transvaal, and during the three years he remained there he was instrumental in producing a system of veterinary police control that bore immediate fruit in stamping out cattle plague, and in mitigating the ravages of other contagious diseases that had threatened the ruin of the live stock industry in South Africa. His early work in this direction, and his researches in collaboration with Sir Arnold Theiler, then veterinary research officer to the Transvaal, still remain models of technical methods that are well remembered by scientific veterinarians.

In 1905, Stockman was appointed Chief Veterinary Officer to the Board (now the Ministry) of Agriculture, to administer the Diseases of Animals Acts. When he was appointed to the post the veterinary department undertook hardly any research work, but thanks to the hearty support and encouragement accorded by Mr. Runciman, during his tenure of office as Minister of Agriculture, a first-class research laboratory was erected near Weybridge for the prosecution of researches into the prevalent animal diseases of this country, and Stockman was then appointed Director of Veterinary Research to the Ministry. The erection of the laboratory—the first institute of its kind in this country—has been abundantly justified by the output and character of the work turned out from it subsequently. The most notable researches have been in connection with the contagious abortion in cattle,

and 'redwater,' scrapie, and louping-ill of sheep, certain diseases of poultry, and swine fever, and recently investigations of a very delicate technical order have been begun upon the nature of the foot-and-mouth disease virus.

As the technical head of the organization for the control of contagious animal disease in this country, Stockman has been responsible for the development of the efficient department comprised of qualified veterinary surgeons that has prevented the introduction of such diseases as rabies, controlled the spread of diseases like swine fever, and recently come most prominently to the attention of agriculturists and the general public in connection with the courageous and drastic measures adopted to prevent foot-and-mouth disease from asserting itself as a limiting factor of immeasurable severity to the live stock industry of this country. The technical responsibility of adhering to the 'stamping-out' policy of dealing with this disease and planning effective measures for putting it into execution was shouldered by Stockman, practically alone, and the extremely arduous duties connected with this work must have told heavily upon his physical health in recent years.

As a professional expert, his work in connection with departmental committees on anthrax, epizootic abortion, swine fever, and foot-and-mouth disease are well known.

He was joint editor of the *Journal of Comparative Pathology and Therapeutics*, a member of the Council of the Royal College of Veterinary Surgeons, president of the Royal College of Veterinary Surgeons during the year 1924-25, member of the managing committee of the Tropical Diseases Bureau and Imperial Bureau of Entomology, and a member of the governing board of the Royal Veterinary College, London.

Sir Stewart Stockman—he was knighted in the New Year honors, 1913—was a brother of Dr. Ralph Stockman, Professor of Materia Medica and Therapeutics in Glasgow University, and Sir Stewart was on a visit to his brother at the time of his death. He is survived by Lady Stockman, who is a daughter of Sir John M'Fadyean, Principal of the Royal Veterinary College, and whom he married in 1908, and by two daughters.

WILLIAM J. WILSON

Dr. William J. Wilson, of London, Ontario, died November 21, 1925. Born September 5, 1863, he attended the Ontario Veterinary College and was a member of the class of 1885. He entered into a partnership with his father, the late Dr. James H. Wilson (Ont. '68), of London, Ont., and practiced up to the time of his death. He was a past president of the Ontario Veterinary Association, a member of King Solomon's Lodge, A. F. & A. M. and of the Orange Order. The deceased was a brother of Lieutenant Colonel John H. Wilson, Canadian Army Veterinary Corps.

THOMAS H. RIPLEY

Dr. Thomas Henry Ripley, of Newark, N. J., died December 31, 1925. He was a graduate of the American Veterinary College, class of 1890, and held the position of Assistant Bacteriologist in the Department of Health, city of Newark, from July 3, 1902, to the time of his death.

JESSE F. HUMPHREVILLE

Dr. Jesse F. Humphreville, of Watertown, Mass., died very suddenly at his summer home, Temple, N. H., April 16, 1926.

Born in Lanesboro, Mass., September 19, 1875, Dr. Humphreville received his early education in the public schools of his native town, later on taking a preparatory course at a private school in Boston. He was a lover of horses, and before he decided to study veterinary medicine he was actively engaged in the training and driving of race horses, having handled some of the fastest trotters in the country. He entered the University of Pennsylvania in 1906 and received his veterinary degree in 1909. He practiced at Brookline, Mass., until 1914 and after that at Watertown, Mass.

Dr. Humphreville was a member of the Massachusetts Veterinary Association, the B. P. O. E., Pequossete Blue Lodge, Waltham Royal Arch, Cambridge Council, Gethsemane Commandery, Aleppo Temple Shrine, Boston Square and Compass Club, Alpha Psi Fraternity, and the Metropolitan Driving Club, of Brighton. He is survived by his widow (née Ella M. Leavitt, of Portland, Me.), four sisters and five brothers.

ROY C. LIVERS

Dr. Roy C. Livers, of Chicago, Ill., died May 8, 1926, from heart trouble. He was in his forty-eighth year. Dr. Livers was a graduate of the Kansas City Veterinary College, class of 1906. He was in the federal meat inspection service for several years before entering college and resumed this work after graduation. He was stationed at Kansas City, Wichita, and later at Chicago.

DAN J. ROONEY

Dr. Dan J. Rooney, of Estevan, Saskatchewan, died May 10, 1926, after an illness of about a week, due to pneumonia. He was forty-six years of age. Dr. Rooney was a graduate of the Chicago Veterinary College, class of 1912, and had practiced at Estevan ever since his graduation. He was a member of the Alpha Psi Fraternity.

MARRIAGES

Dr. W. S. Drummond (Chi. '05), of Plymouth, Ind., to Mrs. Florence Drummond, of South Bend, Ind., May 13, 1926.

Dr. W. H. Wooters (Chi. '13), of Champaign, Ill., to Miss L. Linna Potee, at Champaign, June 22, 1926.

Dr. H. S. Sutton (Corn. '23), of Unadilla, N. Y., to Miss Eva M. Harker, at Ithaca, N. Y., June 25, 1926.

BIRTHS

To Dr. and Mrs. C. J. Primising, of Melvin, Iowa, a daughter, Cecelia Irene, May 10, 1926.

To Dr. and Mrs. A. M. Mills, of Schoharie, N. Y., a daughter, Frances, June 15, 1926.

PERSONALS

Dr. R. A. Merrill (Iowa '26) has located at Clara City, Minn.

Dr. O. E. Walgren (K. S. A. C. '26) has entered practice at Denver, Colo.

Dr. John F. Wood (Ont. '13), formerly of Gifford, B. C., is now at Matsqui, B. C.

Dr. C. D. Bailey (T. H. '13), formerly at Washington, Iowa, is now in Sioux City.

Dr. H. Jensen (Chi. '00) is again in Europe, paying another visit to Copenhagen, Denmark.

Dr. L. O. Leitzman (Ind. '24), formerly of Clayton, Ind., has removed to Knightstown, Ind.

Dr. C. H. Patterson (Iowa '26) has decided to locate for practice in his home town—Tiskilwa, Ill.

Dr. W. J. Embree (Chi. '10), of Chicago, Ill., was among the veterinarians called to camp duty during July.

Dr. C. L. Briggs (U. P. '26) has located for practice at Dubois, Pa., the center of a thriving dairy section.

Dr. Chelsea T. Paulish (O. S. U. '26) is associated in practice with his father, Dr. W. F. Paulish (Ind. '16), of Franklin, Ind.

Dr. J. C. Flynn (K. C. V. C. '10), of Kansas City, Mo., was among those who attended the recent Eucharistic Congress in Chicago.

Dr. C. J. Buehler (K. C. V. C. '17), of Morton, Ill., is the owner of a cow which freshened when she was 11 months and 22 days old.

Dr. G. C. Foster (Ind. '09) has resigned his position with the State Veterinary Department, and has resumed practice at Greenwood, Ind.

Dr. H. F. J. Arundel (Cin. '19) has resigned his position with the U. S. B. A. I., and entered general practice at Statesboro, Ga., August 1.

Dr. W. J. Gibbons (Corn. '25) has been appointed instructor in veterinary medicine at the N. Y. State Veterinary College, Cornell University.

Dr. C. C. Rife (Corn. '25), of Atlanta, Ga., made a combined pleasure and business trip to Ithaca and Cornell University, the latter part of May.

Dr. W. A. Axby (Ohio V. C. '95-Cin. 05), of Harrison, Ohio, was unanimously elected president of the Kiwanis Club recently organized in Harrison.

Dr. W. H. Simmons (Ont. '92), formerly state veterinarian of Kentucky, is now a member of the Louisville office of the State Live Stock Sanitary Board.

Dr. Carl J. Fox (Mich. '26), of Arenac, Mich., was recently called to attend a Holstein calf that weighed only thirty pounds at birth, normal and perfectly formed.

Dr. J. O. R. Campbell (Chi. '07), of Geneva, Ind., reports a much larger number of colts in his territory this year than at any time during the past ten years.

Dr. J. J. Clark (K. S. A. C. '23), who has been at the New Jersey Agricultural Experiment Station for the past year, is now at the Vineland Training School, Vineland, N. J.

Dr. Wm. Albright (T. H. '16), of Colfax, Ind., underwent the Pasteur treatment the latter part of June, as a precautionary measure, after treating a cow that died of rabies.

Dr. F. A. Shepherd (Chi. '03), of Fairmount, Ill., has been appointed Boone County (Ill.) Veterinarian to succeed Dr. H. D. Chamberlain, who resigned after four years of service.

Dr. C. A. Nelson (K. C. V. C. '08), of Brainerd, Minn., whose trip to Europe was announced in the May issue of the JOURNAL, has returned to his home and reports a very fine trip.

Dr. J. A. Winkler (Cin. '18), of Newport, Ky., and Dr. Harry Gieskemeyer (Cin. '12), of Fort Thomas, Ky., have formed a partnership and opened a small animal hospital at Newport.

Dr. E. R. Cushing (Corn. '20), formerly instructor in veterinary medicine at the N. Y. State Veterinary College, has accepted a position with H. K. Mulford Company, of Philadelphia, Pa.

Dr. A. G. Merrick (O. S. U. '24), who has been in practice at Cambridge City, Ind., for about two years, has accepted a position as assistant professor of bacteriology at the University of Wisconsin.

Dr. B. W. Murphy (Chi. '99), president of the Stuppy Floral Company, of St. Joseph, Mo., recently addressed the St. Joseph Contact Club on the subject of "The Origin and Production of Roses."

Dr. Hugo Cornehl (Gr. Rap. '08), for several years dairy inspector with the Detroit (Mich.) Board of Health, has been appointed Chief Veterinarian, succeeding Dr. H. H. Sparhawk (O. S. U. '08), resigned.

Dr. Arthur W. Ziebold (Cin. '14), formerly veterinarian to the Cincinnati Board of Health and later Chief Food Inspector of Miami, Florida, was appointed Director of the Public Welfare Department of Miami, July 1, 1926.

Dr. A. A. Feist (U. P. '12), of St. Paul, Minn., recently spent two months in the care of the Mayo Brothers at Rochester, Minn., the victim of neuromuscular rheumatism. He was able to return to his practice the latter part of June.

Dr. Ray W. Gannett (Corn. '05) and Dr. Harry B. Risley (Corn. 09') have announced the removal of their office and the Berns Veterinary Hospital, from 74 Adams Street, to their modern sanitary building, at 59 Lawrence Street, Brooklyn, N. Y.

Dr. Joseph Patt (K. C. V. C. '93), of Mobile, Ala., whose trip to Europe was announced in the May issue of the JOURNAL, has been heard from by way of a postal card from Lourdes, France, addressed to the Editor. Dr. Patt wrote that he was in the best of health.

Dr. C. V. Noback (Corn. '11), who has been located at Albany the past year, has been appointed veterinarian of the New York Zoological Park by the Executive Committee of the New York Zoological Society. Dr. Noback entered upon his new duties June 1.

Dr. George H. Hart (U. P. '03), who has been professor of veterinary science at the University of California, Berkeley, for a number of years, has been appointed head of the Division of Animal Husbandry, at University Farm, Davis, and assumed his new duties July 1, 1926.

Dr. E. M. Massinger (N. Y. C. V. S. '91), of Phoenixville, Pa., recently met with a serious and painful accident. He was struck by a train at a grade-crossing and sustained a compound fracture of the knee. The latest report was to the effect that he was making a satisfactory recovery.

Dr. Josiah T. Little (U. P. '17), of Bloomsburg, Pa., was nominated to the Legislature on the Democratic ticket, out of a field of three candidates, at the recent primary election. Dr. Little is practically assured of election, as Columbia County is strongly Democratic. He served in the regular 1925 session and in the special 1926 session of the Legislature.

Dr. H. Van Roekel (Iowa '25), who has been a member of the veterinary staff of the Virginia Polytechnic Institute the past year, has accepted a position in the Department of Veterinary Science and Animal Pathology at the Massachusetts Agricultural College, Amherst. Dr. Van Roekel will devote most of his time to work with bacillary white diarrhea.

Dr. Lloyd C. Moss (Wash. '23), who for the past two and one-half years was in the employ of the Honolulu Dairymen's Association as manager of the Milk Department, resigned, June 1, to accept the position of deputy territorial veterinarian for the Island of Maui with the Board of Agriculture and Forestry of the Territory of Hawaii. Dr. Moss has his headquarters at Paia, Maui, T. H.

Dr. W. Albertson Haines (U. P. '07), of Bristol, Pa., was nominated, without opposition, as a candidate for the Legislature, on the Republican ticket, at the recent primary elections in Pennsylvania. Dr. Haines has already served four successive terms as a member of the House of Representatives. He served as chairman of the House Committee on Agriculture in the 1923 and 1925 sessions, as well as in the special session of 1926.

Dr. Carl B. Lenker (Chi. '16), of Colome, S. D., has been elected State Commander of the American Legion for South Dakota. Dr. Lenker enlisted at Chicago, July 17, 1917, and was discharged, with the rank of First Lieutenant, April 9, 1919. He returned to Colome and organized Local Post 146. Dr. Lenker served the post as Commander for three years and has been a member of the Executive Committee ever since the post was organized. He served as Executive Committeeman from his district for six years and served the Department of South Dakota as Vice-Commander for two years.